Fig. 1.

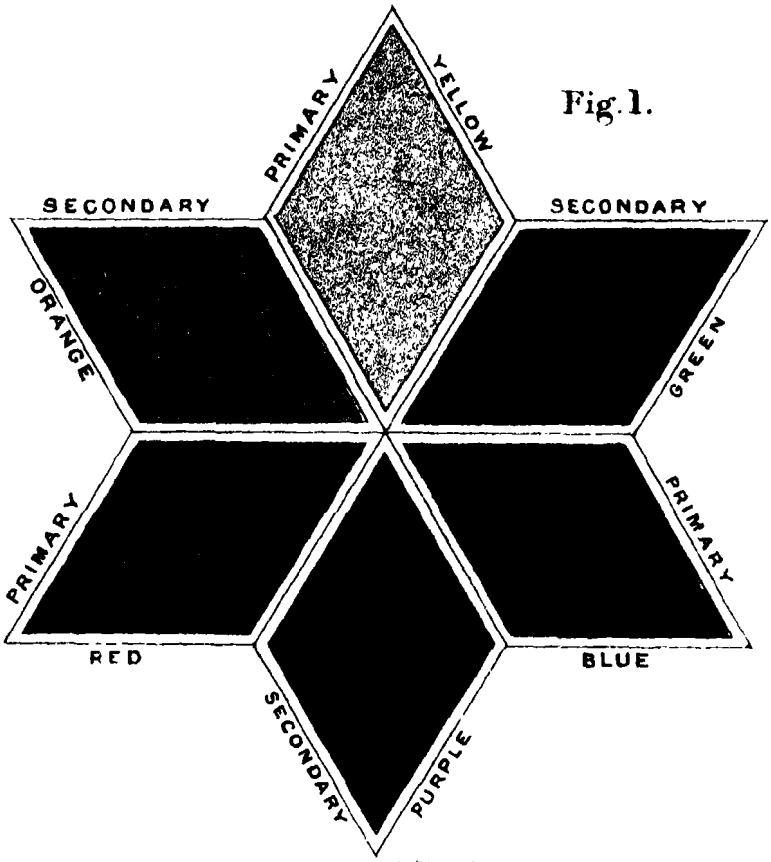


Fig 2.

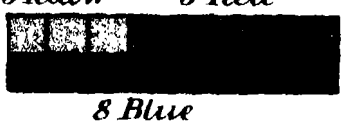


Fig. 3.

Fig 4.

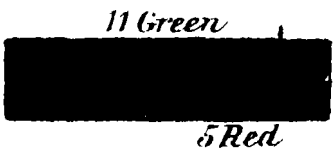


Fig. 5.

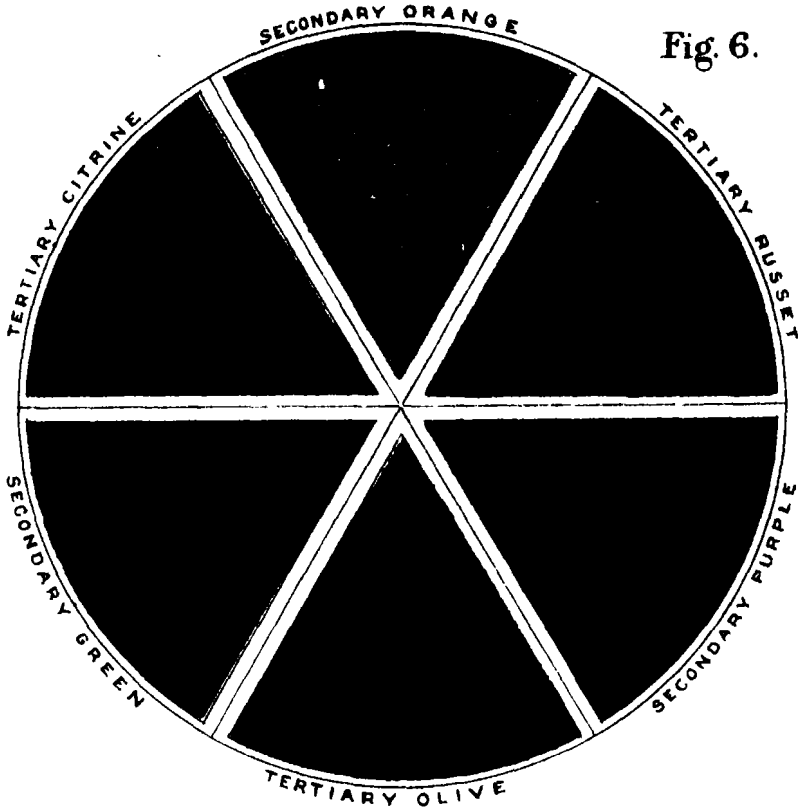


Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Ellis A. Davidson fec.

A

GRAMMAR OF COLOURING

APPLIED TO

DECORATIVE PAINTING AND THE ARTS

By GEORGE FIELD

AUTHOR OF "CHROMATICS; OR, THE ANALOGY, HARMONY, AND PHILOSOPHY OF COLOURS"

REVISED, ENLARGED, AND ADAPTED TO THE USE OF THE

ORNAMENTAL PAINTER AND DESIGNER

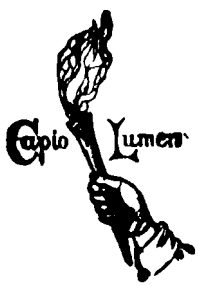
WITH ADDITIONAL SECTIONS ON PAINTING IN SEPIA, WATER COLOURS AND OILS, AND THE HISTORY AND CHARACTERISTICS OF THE VARIOUS STYLES OF ORNAMENT

By ELLIS A. DAVIDSON

AUTHOR OF "THE PRACTICAL MANUAL OF HOUSE PAINTING, GRAINING, MARBLING, AND SIGN WRITING," "LINEAR DRAWING," "PRACTICAL PERSPECTIVE," ETC., ETC.

WITH COLOURED DIAGRAMS AND NUMEROUS WOODCUTS

Seventh Impression



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AUTHOR'S PREFACE.

WISDOM is the presiding attribute of the Divine Architect, and KNOWLEDGE is the wisdom of man.—"Knowledge," Lord Bacon has told us, "is power," which is another of the prime attributes of the Divinity—and the stupendous achievements of knowledge and power since the time of Bacon have made absolute the truth of an aphorism which has been repeated to satiety. But there is yet a third superlatively Divine attribute, of infinitely more importance to the progress and well-being of man than either knowledge or power, and that is GOODNESS or *well-doing*, and there remains only for human attainment the fact that *true knowledge and power are coincident with goodness* to accomplish the original title of man to the resemblance of his Maker.

It is this fact that renders goodness so essential to the acquirement of skill, for skill is nothing else than *well-doing*, which is again coincident with *well-being*, as goodness is with happiness; and these are the essence and the end of *good workmanship*, without which human knowledge and power are not merely in vain, but pernicious in every art and practice [illegible] like fatal to the workman and his work.

Every good [illegible]hd artist has therefore an interest in the conjunction of these prime co-essentials of morals and art; the first requisite condition for which is, that *true knowledge* must be made accessible ere *power* can be employed for *good*.

Meritorious therefore is the enterprise of those publishers who supply the world with genuine knowledge in cheap books; and the industrious individual who expends his superfluous earnings in the purchase of knowledge will have made a step towards power, and put himself in the way of becoming a wiser, an abler, a better, and a happier man, while administering to the good of others.

To such ends may be attributed the zeal with which

eminent writers have lent their aid to these enterprises for disseminating knowledge and science, in humble emulation of whom we have in the following work attempted to communicate the elements of an art which dresses and decorates with beauty all the works of nature and man—namely, the art of employing colours with taste and effect, herein applied to architectural painting and decorative art; in which attempt it will not be necessary to enter further into the theory of light and colours than may be expedient to the improvement of practice, and a correct understanding of their principles; or as an alphabet is essential to written language. Without extending inquiry therefore into the details of literature, which often confound more by exuberance than they enlighten by genuine knowledge, we have advanced our elements under no other consideration than their truth and practical utility.

Practice is the acquisition of the hand and eye under the guidance of a right understanding. Skill in execution belongs to practice, assisted by the precepts of experience. Taste and advancement in art are attributable to refinement of sense and understanding, through correct elements and principles, and these it is the chief office of literature and science to supply. By such means theory and practice concur in advancement, and elevate the aspirant in art. It has been our business to record briefly the best theory in our power, and such practical precepts and information as we have drawn from experience; for such is the object and end of this attempt, by which we hope to communicate in small compass much useful information applicable to ordinary and decorative painting, &c., whether employed for preservation or embellishment; with a design also to advance the amateur or workman already acquainted with his tools, and to add such incidental particulars and suggestions as may be useful to the qualified artist. "If you will have sciences grow," said the great Verulam in his "Advancement of Learning," "you need not be so solicitous for the bodies; apply all your care that the roots [*Rudiments*] may be taken up sound and entire;" and to these we have given our principal attention, avoiding all complication and mystery, neither employing technical terms unnecessarily, nor the cant appellations of labourers, which falsify names and vulgarise art.

PREFACE TO THE PRESENT EDITION.

THE works of Mr. George Field have been so long known to the public, and their excellence is so generally admitted, that they have become text-books, the authority of which has been universally quoted; and it was with a certain amount of diffidence that I undertook the revision of the "Grammar of Colouring."

My earliest and soundest lessons on colour were obtained from this book, and I have therefore touched it with an affectionate hand, guided by that feeling of veneration with which a grateful student approaches the work of an excellent master.

More than twenty years of practical teaching have shown me where the province of the book might be extended, in order that it might more directly touch the class of students who so much need its aid, and I have therefore amplified the work of the author so as to adapt it to the requirements of the government examinations—re-writing for this purpose such portions as seemed to want additional clearness in order to be well understood by those who have not previously had the benefit of a scientific education, and whose technical instruction has unfortunately been too long neglected in this country.

I have therefore introduced new diagrams of the primary, secondary, and tertiary colours, with their numerical equivalents, which will, I trust, render the subject more clear than it has hitherto been. I have next developed the hints on the modes of operation, and have given ample and practical instructions as to the methods of mixing colours, and the manipulation generally adopted in Sepia, Water-colour, Tempera, Oil, and Fresco Painting, with information as to

the materials and implements used—a section which will, I hope, be found practically useful to the student.

A decorative artist, however, who merely paints a border or a scroll because there happens to be a vacant space, without any reference to the appropriateness of his design, or only because he is ordered to do so, becomes a mere living machine, and I have therefore given a sketch of the history of Ornamental Art, showing the growth of the various styles, and giving illustrations of the leading characteristic features of each, in order that the student may be awakened to the necessity of adapting his decoration to the character of the building to be ornamented, and that he may be led to further study of the subject.

The adaptation of the instruction given in this book to the house-painter, grainer, marbler, and sign-writer, is given in a special volume, and I thus cordially dedicate my work to those who are seeking instruction, in the earnest hope that they may be benefited thereby.

ELLIS A. DAVIDSON.

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THE

GRAMMAR OF COLOURING.

PART I.

OF COLOUR GENERALLY.

CHAPTER I.

THE ELEMENTS OF COLOURS.

If, in this utilitarian age, we are asked, "What is the use of colour?" we are constrained, however reluctantly, to answer: "Not any." True, it assists in distinguishing forms, but a few hard lines—though militating sadly against beauty—would accomplish this purpose, whilst distance could, as far as art is concerned, be indicated by lines of various degrees of depth; a fact which is proved by the exquisite effects thus obtained in engravings.

Nor do we find that even the colours of flowers serve any real purpose beyond charming the eye; and this same argument might be applied to sounds, for, if judged by the merely utilitarian standard, music must, as far as practical purposes are concerned, be pronounced useless.

Yet persons over whom music and colour have no influence are happily rarely met with. Can we fancy

this glorious garden of the world peopled with dumb and colourless birds; our fields deprived of their grateful verdure; our hedges and our gardens robbed of their infinite variety of hues?

In the colours which pervade creation—as in the music which so gratefully affects our senses—our merciful Creator has superadded beauty to utility, and we feel that "man liveth not by bread alone," but that the works of the Almighty are designed so as to surround us with everything that shall make this work-day world one in which the higher faculties of the mind may be exercised, and in which the earth may yield to the man who cultivates it, not only the food for his children, but the flowers to beautify their home.

It is in this way that Decorative Art has arisen; for the history of the world has shown us that the moment the absolute necessities of shelter have been supplied, the next effort has been to beautify. In the ruder conditions of man, however, this desire has been satisfied by the use of bright and positive colours; it has been reserved for the cultivated taste of civilisation to define the relative proportions in which the colours should be used to each other, and the means by which they may be contrasted or harmonized with each other.

The elements or natural powers by which colours are produced are the positive and negative principles of Light and Darkness, and these in painting are represented by *white* and *black*, which are thence elementary colours; between the extremes of which exists an infinite gradation of shades or mixtures, which are called *greys*, affording a scale of neutral colours.

As by the deflection of a *point in space* may be generated all the elementary and complex figures and forms of geometrical and constructive science, so from a like

deflection of a *spot in place* may be generated all the elementary and compound hues and colours; the science of which is called Chromatics.

Thus a spot of any shade or colour on a ground or medium lighter or darker than itself, being viewed by a Lensic Prism, will be deflected by the ordinary refraction of light and shade into an orb of three colours. These three colours are the known *Blue*, *Red*, and *Yellow*, which as they are incapable of being produced by composition, and also of being resolved into other colours by analysis, are simple, original, and *primary colours*, elicited by the electrical excitement, or concurrence of the light and shade of the ground and spot.

Accordingly, if the ground and spot be varied from light to dark, or from black to white, the same process will afford the same three colours, differing only in the inversion of their arrangement, being the order of the colours in the celestial phenomenon of the rainbow—"the triple bow" of the poets—in which the sun supplies the central spot of light, which is deflected or refracted by the rain and atmosphere on the dark screen of the sky.

This evolution of colours from the positive and negative or polar principles of light and darkness is a simple fact of nature, however the colours may be produced by electrical influence, wherewith it accords that a due reunion of the three colours, or their compounds, will discharge the colours excited and restore the colourless spots and grounds; and in like manner the negative or *neutral* colours may be composed by mixture of the positive material colours, or pigments of the painter. And thus we have educed from nature the first order of colours in the sequence of their relation to black and white.

In these experimental evolutions of transient colours from light and darkness, a polar influence determines the blue colour, and its allies, towards black or darkness as the negative pole, and the yellow, followed by red and their allies, toward the positive pole of light, or white. And this is a constant law of chromatism, by which all the relations of colours are determined, as well in respect to vision and the requirements of taste and arrangement as to their physical properties and calorific powers. And it coincides also with the electrical affinities by which colours are determined chemically according to an undoubted universal law.

CHAPTER II.

THE THREE ORDERS OF COLOURS.

Colours may be classed under three heads—primary, secondary, and tertiary.

Any two of the primaries mixed in the proportions to be spoken of presently produce a perfect secondary colour, which harmonizes with the remaining primary. Thus Blue and Yellow form Green, which harmonizes with Red. Yellow and Red produce Orange, which harmonizes with Blue. Red and Blue form Purple, which harmonizes with Yellow.

Finally, in like manner, by the alternate compounding or mixing of these secondary colours in pairs, is produced a third order of colours, thence called *tertiary colours:* thus, if Green be mixed with Orange colour,

they will form a *Citrine*, or citron-colour; if Orange be mixed with Purple, they form *Russet;* and if Purple be mixed with Green, they form *Olive* colour; and these new denominations of colours, *Citrine, Russet, and Olive, constitute the third order of colours,* each of which is variously compounded of the *three* original or primary colours, as the second order is of *two;* the primary order being *single* and uncompounded; and lastly by duly mixing or compounding either of the three orders of colours, *Black* will be produced, terminating the series in *neutrality of colour.*

By the varied and due admixture of these colours is produced the infinity of hues, shades, and tints with which the works of nature are decorated, and which abound in the works of art; and all those individual colours which every season of fashion brings forth under new denominations, but which have been regarded by vulgar, uncultivated sense as individually distinct, without order or dependence, the arbitrary inventions of fancy.

By an indefinite and disproportionate mixture, however, of the three colours of either order, or of the whole together, will be produced only the hues usually called dirty, or the anomalous colour *Brown.* The browns are nevertheless a valuable class of colours of predominantly warm hues; whence we have *Red and Yellow Browns,* and browns all hues except *Blue,* which is especially a cold colour affording in like manner the very useful but anomalous class of *Greys,* distinguished from the neutral *Grey,* being also the contrary and contrast of Brown.

The primary colours themselves may, however, be materially altered by admixture: thus, by mixing them in varied proportions, all *Hues* of colour are produced. These *hues* being diluted with white form

tints, or by being toned with black give the different *shades* of colour.

Referring to the purity of colours, Mr. R. Redgrave says:—"It is necessary to remember that pigments, such as are used by the dyer or painter, are but representatives of colours, and that they but very imperfectly represent the primaries. There is no Yellow pigment, for instance, of which it can be safely averred that it is free from any mixture either of Red or Blue; no Red that is untainted by Yellow or Blue; nor any Blue so pure as to be without any mixture of Yellow or Red.

"If pigments could be obtained truly representing each primary, the laws of colour might be perfectly illustrated; but since this is not possible, either as respects purity of colour or power of mixing, explanations of the laws of harmony are beset with many difficulties. Even when pigments are obtained which nearly represent the respective primaries; from various causes, such as differences of transparency or opacity, chemical components, or other qualities, they do not perhaps mix to produce even an approach to a perfect secondary colour."

CHAPTER III.

CONTRASTS AND ACCORDANCES OF COLOURS.

It has been shown that colours are primarily elicited analytically from the positive and negative principles

* Painting among the Hindoos, the Egyptians, and still in our days amongst the Chinese, imposes its regulations in the national worship and politic laws; the least alteration in the drawing or colouring

or poles of light and shade, represented by White and Black, which are Neutral as colours, and that consequently by a due reunion or composition of the colours thus educed they are restored to the neutral state of *Black, White,* or *Grey.*

The production of the secondaries by mixture of the primaries will be understood from the illustration (Fig. 1), in which each primary is placed opposite to the secondary formed by the remaining two.

Such opposed colours, in adequate proportions, are called complementary, from the equivalence with which they neutralise each other; their powers in which respect we have demonstrated to be according to the following Scale of Chromatic Equivalents. (Fig. 2.)

In this *Scale of Equivalents* the fundamental powers of the primary colours in compensating and neutralising, contrasting and harmonizing, their opposed secondary colours are approximately as *three* Yellow, *five* Red, and *eight* Blue; consequently the secondary *Orange,* composed of three Yellow and five Red, is the equivalent of *Blue* the power of which is eight: they are accordingly equal powers in contrast, and compensating in mixture, and as such are properly in equal proportions for harmonizing effect. (Fig. 3.)

Again *Green* being composed of Blue the power of which is eight, and Yellow the power of which is three, is equivalent in contrast and mixture as eleven, to *Red* the power of which is five; being nearly as two to one. (Fig. 4.)

And finally *Purple* composed of Blue as eight, and Red the power of which is five, is equivalent in mixture or contrast as thirteen, to *Yellow* the power of which is

would incur a serious punishment. Among the Egyptians, writes Synesius, the prophets did not allow metal-founders or statuaries to represent the gods, for fear that they should deviate from the rules.—*Baron F. Portal on Symbolic Colours.*

three, or nearly as four to one. And such proportions of these opposed colours may be employed in forming agreeable and harmonious contrasts in colouring and decorative painting, either in pairs of contrasts, or several, or all together; and also for subduing each other in mixture. (Fig. 5.)

The tertiary colour *Citrine* harmonizes with the secondary colour *Purple* in the proportion of nineteen Citrine to thirteen Purple. The tertiary colour *Olive* harmonizes with the secondary *Orange* in the proportion of twenty-four Olive to eight Orange. The tertiary colour *Russet* harmonizes with the secondary *Green* in the proportion of twenty-one Russet to eleven Green. These proportions are illustrated in Figs. 6, 7, 8, 9.

And further it is apparent that all compound hues of these colours will partake of their compound numbers, and contrast each other according to a corresponding compound equivalence. Thus an intermediate Red-purple will contrast a like opposite Green-yellow with the power of eighteen to fourteen, and so on without limit all round the scale; and the triple compounds or tertiary colours are subject to like regulation.

There is no invariable necessity, nevertheless, that this regulation of contrasts should be followed strictly according to their numbers in harmonizing colours, although they denote their principal and most powerful effects; for every individual colour has its appropriate expression, for which it may be employed predominately as a key; thus affording an infinity of distinct harmonies to fertilise taste and invention, by brilliant and delicate or sober and sombre effects according to the purpose of the Artist or Decorator.*

* After the five colours come the compound hues: rose, purple, hyacinth, violet, grey, tan, &c. These hues receive their significations from the colours which compose them. That which predominates

CHAPTER IV.

ILLUSTRATIONS OF COLOURING.

THE exercise of taste, and the demands of novelty and fashion, in decoration, and beautifying with colours, have a boundless field of exertion and production in the application of the foregoing principles, wherein the genius and taste of the Colourist has scope as ample for delighting the eye as that of the Musician in the art of harmonizing sounds; and to do justice by examples to these powers in either art would be a vast undertaking, if not a vain attempt.

As the object of these pages is not merely to enable the student to learn by rote a list of the numerical proportions of colours, but to assist him in the appreciation of the principles laid down, it is suggested that he should work out the system inculcated in a series of diagrams, for which the following hints will supply the data.

1. The harmonizing or contrasting of *Blue* with *Orange*, or of cold with warm colours, which are general equal powers or equivalents; and as such are instanced in nature by the warm sunshine and azure sky. It is in the same relation that Blue is employed effectively with Gold.

2. This study should be the accordance of *Red* with *Green;* the first of which is the extreme of colour, as the latter is the mean or middle colour, and they harmonize as one to two in power or equivalence, and

gives to the hue its general signification, and that which is subordinate, the modified. Thus purple, which is of a red azure, signifies the love of truth; and hyacinth, which is of a blue purple, represents the truth of love. These two significations would seem to confound themselves at their source, but the applications will show the difference which exists between them.—*Baron* ᵀ *Portal on Symbolic Colours.*

are remarkable in the roseate blossom with the green foliage throughout nature.

3. This arrangement should be the general accordance of *Yellow with Purple,* which are complementary nearly as one to four; the first as an advancing or light, the second as a retiring or shade colour; and they are reciprocally employed by nature in giving effect to Purple and Yellow flowers. The above are leading examples only; but it would be easy, were it expedient, to multiply them to any amount.

It is a matter of necessary knowledge to the Artist, and of useful information to the Decorator of taste, that in nature *the colours of shadows and shadings are always true contrasts to their lights,* and affords a rule to harmonious art, the neglect of which is a common cause of failure, and dulness of effect. Hence it may merit attention that rooms, &c., lighted from a cold or northern aspect would be of best effect when having their ornamental designs shaded with warm colours; and that, on the contrary, cool shadows are required in rooms of a southern and sunny aspect. The artist, however, who is acquainted with the true relations of light and colours, will be at no loss in adapting his practice to the peculiarity of the case or situation.

Not only are there the foregoing harmonies of Succession and Contrast among positive colours, there also is a like contrast of Colour with Neutrality, or of positive Hues with negative Shades. It is hence that coloured backgrounds agreeably relieve sculptures, which are white or neutral; and that *Blue* does so more effectively than other colours, because sculptures having their own relief, and being powerfully reflective of light, are best contrasted and advanced by that colour which is of nearest affinity with shade, and such is blue. We find accordingly that the Greeks relieved

the sculptures of their temples, &c., by Blue backgrounds, which at once harmonized with the sculpture and the sky.

So again, in contrasting Black objects with coloured grounds, such as engravings, neutral drawings or designs, &c., the colour nearest in relation to light, being a warm Yellow, is for the above reason theoretically and practically of best effect. And these will be sufficient to suggest the proper practice in the conduct of Colours and Neutrality in other cases.

It is to be observed that the simple principles we have adduced as a guide to the ordinary employment of colours are but the suggestive elements of a science as boundless as practical geometry, into the intricacy of which the decorator needs not enter, any more than into the subtilities of the latter science; and the mind delighting in such speculations, or emulating the higher accomplishments of art, will find the inquiry extended in our "Chromatics; or the Analogy, Harmony, and Philosophy of Colours," and other works.

So much then in briefness for the theoretic relations of colours, the knowledge of which is to be regarded as essential to their free and appropriate application in painting; and indispensable for elegance of design in all arts calling for an harmonious and original display of taste, for which some practical hints will appear in our subsequent notes on individual colours and pigments, further detailed also in our "Chromatography."

Fashion, it is true, governs Operatives and Decorators in their works and designs, but when these artists are well instructed and masters in principles, they will guide and influence fashion by nature and good taste, —advancing art by purifying it from those barbarous and gaudy obtrusions on chaste design which ever denote art in its infancy or decline. As to the aids of

literature, it can do little more for the artist and artisan than present them with these principles and precepts, the application of which is an affair of their own skill and faculties, in which they have liberty of action but not equality of powers, for these are divine gifts from nature, or the rewards of acquired skill and industry.

In the choice, admiration, and display of colours we find crude, natural, and uncultivated taste, as in children and savages, delighting in, and employing, entire and primary colours, and harsh, unbroken, or whole notes in their music; but as taste and sober judgment advance, sense becomes more conciliated by broken colours and half-tones, till, in the end, they refine into the more broken and enharmonic. The same laws still govern them in practice, and the contrasts of which we have given the first crude examples may still be as strictly employed with colours extremely subdued, and with the utmost refinement of broken tints and delicacy of expression.

Thus colours are no less a science than musical sounds, to which they are every way analogous; and as the musician may be thoroughly acquainted with harmonic science, and able to detect all the errors of the composer and performer of music without himself being able either to compose or perform,—so also it is with the informed and critical colourist, whether decorative artist or man of taste; for the excellent works of both arts are the productions of science, conducting genius or natural taste, and a practised hand. To this end our rules are offered as a compass to unrestrained fancy, that, without a guide, would run into tasteless extravagance and absurdity.

PART II.

PRACTICAL COLOURING.

CHAPTER V.

MATERIAL COLOURS.

HAVING exhibited the sensible principles, relations, and effects of colours sufficiently for general understanding and use in a theoretic view, it is expedient to practice that we briefly advert to their material or physical nature and habits; because upon these depend the durability, fugacity, and changes to which colouring substances and pigments are subject and their works exposed; while it supplies useful experience to the painter and colourist in the practice of their arts.

Colours we have distinguished into *Inherent* and *Transient*. Of the first kind are all material colours, more properly called pigments and dyes; of the second or transient kind are the colours of light and the eye, such as the rainbow, halos, prismic and ocular spectra, &c.; all of which, as before shown, are formed by the concurrence of the elements of light and darkness, which elements, in the language of the chemists, are oxygen and hydrogen, both of which enter inherently into the matter of solid pigments, and constitute the transient

light of our atmosphere and of day. Hence paintings, &c., excluded from light and air in many cases become dark, and in other cases, when exposed to light and air, they bleach and fade, or variously change colour according to their chemical constitutions, as will be further noted of individual pigments.

We have employed the terms Oxygen and Hydrogen to denote the more properly *Photogenic* and *Sciogenic* elements of light and shade, not for their fitness, but because they have been adopted in an analogous elementary signification in chemistry. It would, however, be beside our purpose here to discuss the elementary doctrine of the physical causes of light and colours, having spoken thereof more at large in other works.

We proceed, therefore, in the next place, to detail the powers, properties, and preparations of the materials employed in the various practices of painting, among which pigments, or paints, are principal, reminding the student that the variety of lightness and darkness in colours is called *Shade;* the varieties of gradations in the mixtures of colours are called *Hues,* and the various mixtures of hues and colours with white and shades are called *Tints.* We preface these and other distinctions as necessary to the painter for the better understanding and compounding of his materials, with which it is the object of this part of our work to make him acquainted.

CHAPTER VI.

QUALITIES OF PIGMENTS.

THE general qualities of good *Pigments,* technically called *Colours,* are: 1, beauty of colour, which includes

pureness, brightness, and depth; 2, body; 3, transparency or opacity; 4, working well; 5, keeping their place; 6, drying well; and 7, durability; but few pigments possess all these qualities in equal perfection.

Body, in opaque and white pigments, is the quality of efficiently covering and hiding ground, but in transparent pigments it signifies richness of colour, or tinting power; working well depends much on sufficient grinding, or fineness of quality; keeping their places and drying well depend in a great degree on the vehicle, or liquid, with which they are tempered, and chiefly on the oil with which they are employed.

All substances are positively or negatively coloured, whence the abundance of natural and artificial pigments and dyes with which the painter and colourist in every art are supplied, and the infinity of others that may be added to them. As, however, it is *durability* that gives value to the beauty and other qualities of colours or pigments, and those of nature being for the most part adapted to temporary or transient purposes, few only are suited to the more lasting intentions of art, and hence a judicious selection is essential to the practice and purposes of artists.

And as the present inquiry is concerning the employment of solid colours in painting, properly called Pigments, it is our express business to form such selections from those in use as are best adapted to the various requirements of painting in oil or water-colours, in distemper, fresco, &c., and to denote their habits, mixture, and best modes of manipulation of each, and this we purpose in the order of the colours as delivered in the preceding scales.

In *mixing colours* the painter should avoid using a greater number of pigments than necessary to afford the tints required, as such mixtures are usually fouler

than the colours used, and their drying and other qualities are commonly injured thereby. We by no means counsel the painter to lose his time in the preparation of original pigments, the processes of manufacture having in recent years been carried to such perfection that any attempt to compete either in levigation or admixture with the colours sold at the first-rate houses would be futile. Old pigments are also more to be depended on than new ones for drying, standing, &c. We proceed to speak of colours and pigments individually.

CHAPTER VII.

OF WHITE AND ITS PIGMENTS.*

WHITE †

Is the basis of nearly all opaque painting designed for the laying and covering of grounds, whether they be

* "Colours" and "Pigments" are commonly confounded, but pigments, or, as they are popularly termed, *paints*, are those substances possessing colouring power in so eminent a degree that they are used on account of that property; pigments are, so to speak, material colours. "Colours" have a generic signification, including the phenomena of colour, whether considered in the abstract or the concrete.—GULLICK AND TIMBS, *Painting Popularly Explained.*

† *Of white colour.*—The Moors designate, by this emblem, purity, sincerity, innocence, indifference, simplicity, candour; applied to a woman, it implies chastity; to a young girl, virginity; to a judge, integrity; to a rich man, humility. Heraldry, borrowing this catalogue, ordained that, in coats of arms, argent should denote whiteness, purity, hope, truth, and innocence. Ermine, which was at first all white, was the emblem of purity and of immaculate chastity; and we hold, says Lamothe Le Vayer, the whiteness of our lily, of our scarfs, and royal pennant, a symbol of purity as well as of liberty. White represents immaculate chastity—it was consecrated to the Virgin; her altars are white, the ornaments of the officiating priest are white, and likewise, on her festival-day, the clergy are in white.—*Baron F. Portal on Symbolic Colours.*

of wood-work, metal, stone, plaster, or other substances, and should be as pure and neutral in colour as possible for the better mixing and compounding with other colours without changing their hues, while it renders them of lighter shades, and of the tints required; it also gives solid body to all colours.

It is the most advancing of colours; that is, it comes forward and catches the eye before all others, and it assists in giving this quality to other pigments, with which it may be mixed, by rendering their tints lighter and more vivid. Hence it appears to cause colours which are placed near it to recede, and it powerfully contrasts dark colours, and black most so of all. The term *colour* is however equivocal when attributed to the *neutrals*, White, Black, and Greys, yet the artist is bound to regard them as colours; and in philosophic strictness they are such latently, compounded and compensated; for a thing cannot but be that of which it is composed, and the neutrals are composed of and comprehend all colours.

White is the nearest among colours in relation to Yellow, and is in itself a pleasing and cheerful colour, which takes every hue, tint, and shade, and harmonizes with all other colours, and is the contrast of Black, added to which it gives solidity in mixture, and a small quantity of black added to white cools it, and preserves it from its tendency to turn yellow. White mixed with Black forms various Greys and Lead-colour so called.

From the above qualities of white it is of more extensive use in painting than any other colour, and it is hence of the first importance to the painter to have its pigments of the best quality. These are abundant, of which we shall here notice those only of practical importance to the painter and decorator.

Notwithstanding white pigments are an exceedingly

numerous class, an unexceptionable white is still a desideratum. The white earths are destitute of body in oil and varnish, and metallic whites of the best body are not permanent in water; yet when properly discriminated, we have eligible whites for most purposes, of which the following are the principal:—

WHITE LEAD,

Or ceruse, and other white oxides of lead, under the various denominations of London and Nottingham whites, &c., Flake white, Crems or Cremnitz, Roman and Venetian whites, Blanc d'argent or Silver white, Sulphate of lead, Antwerp white, &c. The heaviest and whitest of these are the best, and in point of colour and body are superior to all other whites. They are all, when pure and properly applied in oil and varnish, safe and durable, and dry well without addition; but excess of oil discolours them, and in water-painting they are changeable even to blackness. They have also a destructive effect upon all vegetable lakes, except the madder lakes and madder carmines; they are equally injurious to red and orange leads or minium, king's and patent yellow, massicot, gamboge, orpiments, &c.: but ultramarine, red and orange vermilions, yellow and orange chromes, madder colours, sienna earth, Indian red, and all the ochres, compound with these whites with little or no injury. In oil-painting white lead is essential in the ground, in dead colouring, in the formation of tints of all colours, and in scumbling, either alone or mixed with all other pigments. It is also the best local white when neutralized with black, but must not be employed in water-colour painting, distemper, crayon painting, or fresco, nor with any pigment having an inflammable basis, or liable to be destroyed by fire: for with all such they occasion

change of colour, either by becoming dark themselves, or by fading the colours they are mixed with. Cleanliness in using these pigments is necessary for health; for though not virulently poisonous, they are pernicious when taken into or imbibed by the pores or otherwise, as are all other pigments of which lead is the basis. A fine natural white oxide, or carbonate of lead, would be a valuable acquisition, if found in abundance; and there occur in Cornwall specimens of a very beautiful carbonate of lead, of spicular form, brittle, soft, and purely white, which should be collected for the artist's use.

The following are the true characters of these whites according to our particular experience:—

LONDON AND NOTTINGHAM WHITES.

The best of these do not differ from each other in any essential particular, nor from the white leads of other localities. The latter, being prepared from flake white, is generally the greyer of the two. The inferior white leads are adulterated with whitening or sulphate of barytes and other earths, which injure them in body and brightness, dispose them to dry more slowly, to keep their places less firmly, and to discolour the oil with which they are applied. All the above are carbonates of lead, and liable to froth or bubble when used with aqueous, spirituous, or acid preparations. There are no better whites for architectural painting, and for all the purposes of common oil-painting; they are kept in the shops under the names of best and common white leads ready ground in oil, and require only to be duly diluted with linseed oil and more or less turpentine according to the work; and also for mixing with other colours and producing tints.

KREMS, CREMS, OR KREMNITZ WHITE,

Is a white carbonate of lead, which derives its names from Crems, or Krems, in Austria, or Kremnitz in Hungary, and is called also Vienna white, being brought from Vienna in cakes of a cubical form. Though highly reputed, it has no superiority over the best English white leads, and varies like them according to the degrees of care or success with which it has been prepared.

FLAKE WHITE

Is an English white lead in form of scales or plates, sometimes grey on the surface. It takes its name from its figure, is equal or sometimes superior to Krems white, and is an oxidized carbonate of lead, not essentially differing from the best of the above. Other white leads seldom equal it in body, and, when levigated, it is called body-white.

BLANC D'ARGENT,

Or Silver white. These are false appellations of a white lead, called also French white. It is brought from Paris in the form of drops, is exquisitely white, but of less body than flake white, and consequently does not cover so well. It has all the properties of the best white leads; but, being liable to the same changes, is unfit for general use as a water-colour, though good in oil or varnish.

ROMAN WHITE

Is of the purest white colour, but differs from the former only in the warm flesh-colour of the external surface of the large square masses in which it is usually prepared.

SULPHATE OF LEAD

Is an exceedingly white precipitate from any solution of lead by sulphuric acid, much resembling the blanc d'argent; and has, when well prepared, quite neutral, and, thoroughly edulcorated or washed, most of the properties of the best white leads, but is rather inferior in body and permanence.

The above are the principal whites of lead; but there are many other whites used in painting, of which the following are the most worthy of attention:—

ZINC WHITE

Is an oxide of zinc, which has been more celebrated as a pigment than used, being perfectly durable in water and oil, but wanting the body and brightness of fine white leads in oil; while, in water, constant or barytic white is superior to it in colour, and equal in durability. Nevertheless, zinc white is valuable, as far as its powers extend in painting, on account of its durability both in oil and water, and its innocence with regard to health. When duly and skilfully prepared, the colour and body of this pigment are sufficient to qualify it for a general use upon the palette, although the pure white of lead must merit a preference in oil.

TIN WHITE

Resembles zinc white in many respects, but dries badly, and has even less body and colour in oil, though superior to it in water. It is the basis of the best white in enamel painting.

There are various other metallic whites of great body and beauty,—such are those of bismuth, antimony, quicksilver, and arsenic; but none of them are of any

value or reputation in painting, on account of their great disposition to change of colour, both by light and foul air, in water and in oil.

PEARL WHITE.

There are the two pigments of this denomination: one falsely so called, prepared from bismuth, which turns black in sulphuretted hydrogen gas or any impure air, and is used as a cosmetic; the other, prepared from the waste of pearls and mother-of-pearl, which is exquisitely white, and of good body in water, but of little force in oil or varnish: it combines, however, with all other colours without injuring the most delicate, and is itself perfectly permanent and innoxious.

CONSTANT WHITE,

Permanent white, or Barytic white, is a sulphate of barytes, and when well prepared and free from acid is one of our best whites for water-painting, being of a superior body in water, but destitute of this quality in oil.

As it is of a poisonous nature, it must be kept from the mouth;—in other respects and properties it resembles the true pearl white. Both these pigments should be employed with as little gum as possible, as it destroys their body, opacity, or whiteness; and solution of gum ammoniac answers better than gum arabic, which is commonly used: but the best way of preparing this pigment, and other terrene whites, so as to preserve their opacity, is to grind them in simple water, and to add toward the end of the grinding sufficient only of size, or clear cold jelly of gum tragacanth to attach them to the ground in painting. Barytic white is seldom well purified from free acid, and, therefore, apt to act injuriously on other pigments.

WHITE CHALK

Is a well-known native carbonate of lime, used by the artist only as a crayon, or for tracing his designs; for which purpose it is sawn into lengths suited to the porte-crayon. White crayons, and tracing-chalks, to be good, must work and cut free from grit. From this material, whitening and lime are prepared, and are the basis of many common pigments and colours used in distemper, paper-staining, &c.

There are many terrene whites under equivocal names, among them are Morat or Modan white, Spanish white or Troys, or Troy white, Rouen white, Bougeval white, Paris white, Blanc de Roi, China white, Satin white, the latter of which is a sulphate of lime and alumine, which dries with a glossy surface, is said to be prepared by mixing equal quantities of lime and alum, the first slacked and the latter dissolved in water. The common oyster-shell contains also a soft white in its thick part, which is good in water; and egg-shells have been prepared for the same purpose; white has likewise been obtained from an endless variety of native earths. From this unlimited variety of terrene whites we have selected above such only as merit the attention of the artist; the rest may be variously useful to the paperstainer, plasterer, and painter in distemper; but the whole of them are destitute of body in oil, and, owing to their alkaline nature, are injurious to many colours in water, as they are to all colours which cannot be employed in fresco.

CHINESE WHITE.

This exceedingly useful colour is a preparation of white oxide of zinc mixed with mucilage of gum tragacanth, gum arabic, and a small quantity of glycerine; it is

generally used in water-colour painting, both in compounding tints and in high lights: it is sold in bottles and in compressible tubes; the former are to be preferred, though perhaps not so convenient in fitting into sketching-cases as the latter. The colour washes well, and, as now prepared, is a most valuable adjunct to the list of pigments. The use of body-white has in recent years become a fashion in water-colour painting; but the excessive use of this and other body-colours deteriorates much from the true character of water-colour painting, in which as a rule the lights should be obtained from the paper itself, otherwise the picture must be said to be executed in tempera. Besides this, the very best of whites are liable to discolour, and in that case the effect becomes diametrically the opposite to that intended.

CHAPTER VIII.

TINTS.

White is in every way important in painting, not only as a ground, but as the basis of all tints, as necessary in compounding the endless variety of pale hues which taste and fashion require of the painter and decorator, which every season brings out under new denominations, to give way in turn to others and be forgotten. Thus white tinted with blue, &c., have afforded Paris white, &c., French greys, Silver greys, &c.; while among red tints we have pink, carnation, coquilicot, and all the blushes of flowers, &c.; and yellow with white has afforded Primrose, Straw-colour, Isabella, &c. To the colours compounded more or less

with white, we are indebted for the innumerable tints of Lilac, Lavender, Peach-blossoms, Pea-green, Tea-green, &c.

In order to afford some instruction in compounding a few useful tints the following list is given. The student is advised to mix each of these tints in different hues, giving in each experiment a predominance to one or other of the component colours. The method of applying these colours will be given in another section. These tints are intended for water-colour painting, but most of them may be mixed for tempera or oil painting by the addition of white in varied proportions.

LAVENDER TINTS—which may be diluted until they give the palest French greys.

Lake and Indigo.
Lake and Cobalt.
Indian Red and Cobalt.
Vermilion and Cobalt.

GREY TINTS—of a brown hue—

Madder Brown and Cobalt.
Madder Lake, Cobalt, and Yellow Ochre.
Indian Red and Indigo.
Light Red and Cobalt.
Gamboge, Lake, and Indigo.
Burnt Sienna, Lake, and Indigo.

BROWN TINTS—

Lake Cobalt, and Yellow Ochre.
Lake, Indigo, and Yellow Ochre.
Raw Sienna, Madder Lake, and Cobalt.
Light Red and Indigo.

Vandyke Brown, Lake, and Indigo.
Burnt Sienna, Gamboge, and Indigo.
Vandyke Brown, Gamboge, and Indigo.
Vandyke Brown and Lake.
Burnt Sienna and Lake.

GREEN TINTS—

Italian Pink and Antwerp Blue.
Italian Pink and Lamp Black.
Yellow Ochre and Indigo.
Burnt Sienna and Indigo.
Brown, Pink, and Indigo.
Raw Umber and Indigo.

YELLOW TINTS—

Yellow Ochre and Lake.
Yellow Ochre and Light Red.
Yellow Ochre and Vandyke Brown.

CHAPTER IX.

OF THE PRIMARY COLOURS.

YELLOW.*

YELLOW is the first of the primary or simple colours, nearest in relation to, and partaking most of the nature of, the neutral white, mixed with which it affords the

* This celestial light revealed to men, finds its natural symbol in the light which shines on earth; the heat and the brightness of the sun designate the love of God which animates the heart, and the wisdom which enlightens the intellect. These two attributes of God, manifest in the creation of the world and the regeneration of men,

faint hues called Straw-colour, &c.; it is accordingly a most advancing colour, of great power in reflecting light. Compounded with the primary red, it constitutes the secondary orange, and its relatives, scarlet, &c., and other warm colours.

It is the ruling colour of the tertiary citrine;—it characterizes in like manner the endless variety of the semi-neutral colours called brown, and enters largely into the complex colours denominated buff, bay, tawny, tan, dun, drab, chestnut, roan, sorrel, hazel, auburn, Isabella, fawn, feuillemorte, &c. Yellow is naturally associated with red in transient and prismatic colours, and they comport themselves with similar affinity and glowing accordance in painting, as well in conjunction as composition. In combination with the primary *blue*, yellow constitutes all the variety of the secondary *green*, and, subordinately, the tertiaries *russet* and *olive*. It enters also in a very subdued degree into cool, semi-neutral, and broken colours, and assists in minor proportions with blue and red in the composition of *black*.

As a pigment, yellow is a tender, delicate colour, easily defiled, when pure, by other colours. In painting it diminishes the power of the eye by its action in a strong light, while itself becomes less distinct as a colour; and, on the contrary, it assists vision and becomes more distinct as a colour in a neutral somewhat declining light. These powers of colours upon vision require the particular attention of the colourist. To remedy the ill effect arising from the eyes having dwelt

appear inseparable in the signification of the sun, of gold, and yellow. Divine wisdom had white for a symbol, as divine love, red; golden yellow reunites these two significations and forms them into one; but with the character of manifestation and revelation. This explains an ancient tradition current in emblazonry; authors on the heraldic art pretend that the yellow colour is a mixture of red and white.—*Baron F. Portal on Symbolic Colours.*

upon a colour, they should be gradually passed to its opposite colour, and refreshed in the clear light of day.

In a warm light, yellow becomes totally lost, but is less diminished than all other colours, except white, by distance. The stronger tones of any colour subdue its fainter hues in the same proportion as opposite colours and contrasts exalt them. The contrasting colours of yellow are a purple inclining to blue when the yellow inclines to orange, and a purple inclining to red when the yellow inclines to green, in the mean proportions of thirteen purple to three of yellow, measured in surface or intensity; and yellow being nearest to the neutral white in the natural scale of colours, it accords with it in conjunction. Of all colours, except white, it contrasts black most powerfully.*

The sensible effects of yellow are gay, gaudy, glorious, full of lustre, enlivening, and irritating; and its impressions on the mind partake of these characters, and acknowledge also its discordances.

The substitution of gold, &c., for yellow by the poets may have arisen not less from the great value and splendour of the metal, than from the paucity of fine yellows among those ancients who celebrated the Tyrian purple or red, and the no less famed Armenian blue;—so in the beautiful illuminated MSS. of old, and in many ancient paintings, which glowed with vermilion and ultramarine, the place of yellow was supplied by gilding, and in most cases the artist trusts to the gilding of his frame for some portion of the effect of this colour in his picture: and in every case of decorating with gildings similar allowance should be made.

Yellow is a colour abundant throughout nature, and its class of pigments abounds in similar proportion. We have arranged them under the following heads, agree-

* Ruskin's "Elements of Drawing," second edition, 1857, p. 7.

ably to our plan, according to their definiteness and brilliancy of colour; first the opaque, and then the transparent, or finishing colours. It may be observed of yellow pigments, that they much resemble whites in their chemical relations in general, and that yellow, being a primary and, therefore, a simple colour, cannot be composed by any mixture of other colours.

CHROME YELLOW

Is a pigment of modern introduction into general use, and of which there are several varieties, mostly chromates of lead, in which the latter metal more or less abounds. They are distinguished by the pureness, beauty, and brilliancy of their colours, which qualities are great temptations to their use in the hands of the painter; they are notwithstanding far from unexceptionable pigments;—yet they have a good body, and go cordially into tint with white, both in water and oil; but used alone, or in tint, they after some time lose their pure colour, and may even become black in impure air; they nevertheless resist the sun's rays during a long time. Upon several colours they produce serious changes, ultimately destroying Prussian and Antwerp blues, when used therewith in the composition of greens, &c. Chromes may be in three degrees of depth —pale, medium, and deep.

JAUNE MINÉRALE.

This pigment is also a chromate of lead, prepared in Paris, differing in no essential particular from the above, except in the paleness of its colour. The chrome yellows have also obtained other names from places or persons from whence they have been brought, or by whom they have been prepared, such as Jaune de Cologne; we pass over, however, such as have not been

generally received. The following pigment passes also under the name of Jaune Minérale :—

PATENT YELLOW,

Turner's yellow, or *Montpellier yellow*, is a submuriate or chloruret of lead, which metal is the basis of most opaque-yellow pigments ; it is a hard, ponderous, sparkling substance, of a crystalline texture and bright yellow colour ; hardly inferior, when ground, to chromic yellow. It has an excellent body, and works well either in oil or water, but is soon injured both by the sun's light and impure air ; it is, therefore, little used, except for the commoner purposes of painting.

NAPLES YELLOW

Is a compound of the oxides of lead and antimony, anciently prepared at Naples under the name of *Giallolini ;* it is supposed also to have been a native production of Vesuvius and other volcanoes, and is a pigment of deservedly considerable reputation. It is not so vivid a colour as either of the above, but is variously of a pleasing light, warm, yellow tint. Like all the preceding yellows, it is opaque, and in this sense is of good body, and covers well. It is not changed by the light of the sun, and may be used safely in oil or varnish under the same management as the whites of lead ; but, like these latter pigments also, it is liable to change even to blackness by damp and impure air when used as a water-colour, or unprotected by oil or varnish.

Iron is also destructive of the colour of Naples yellow, on which account great care is requisite, in grinding and using it, not to touch it with the common steel palette-knife, but to compound its tints on the palette

with a spatula of ivory or horn. For the same reason it may be liable to change in composition with the ochres, Prussian and Antwerp blues, and all other pigments of which iron is an ingredient or principle. Oils, varnishes, and in some measure strong mucilages, are preventive of chemical action, in the compounding of colours, by intervening and clothing the particles of pigments, and also preserve their colours: and hence, in some instances, heterogeneous and injudicious tints and mixtures have stood well, but are not to be relied on in practice. Used pure, or with white lead, its affinity with which gives permanency to their tints, Naples yellow is a valuable and proved colour in oil, in which also it works and dries well.

It may also be used in enamel painting, as it vitrifies without change, and in this state it was formerly employed under the name of *Giallolini di fornace*, and has been again introduced, under an erroneous conception that vitrification gives permanence to colours, when in truth it only increases the difficulty of levigation, and injures their texture for working. Naples yellow does not appear to have been generally employed by the early painters in oil. Antimony yellows are prepared of various depths.

MASSICOT,

Or *Masticot*, is a protoxide of lead, of a pale yellow colour, exceedingly varying in tint, from the purest and most tender yellow or straw-colour to pale ash-colour or grey. It has in painting all the properties of the white lead, from which it is prepared by gentle calcination in an open furnace, but in tint with which, nevertheless, it soon loses its colour and returns to white: if, however, it be used pure or unmixed, it is a useful delicate colour, permanent in oil under the same

conditions as white lead, but ought not to be employed in water, on account of its changing in colour even to blackness by the action of damp and impure air. It appears to have been prepared with great care, and successfully employed, by the old masters, and is an admirable dryer, being in its chemical nature nearly the same as litharge, which is also sometimes ground and employed in its stead.

YELLOW OCHRE,

Called also *Mineral yellow*, is a native pigment, found in most countries, and abundantly in our own. It varies considerably in constitution and colour, in which latter particular it is found from a bright but not very vivid yellow to a brown yellow, called *spruce ochre*, and is always of a warm cast. Its natural variety is much increased by artificial dressing and compounding. The best yellow ochres are not powerful, but as far as they go are valuable pigments, particularly in fresco and distemper, being neither subject to change by ordinary light, nor much affected by impure air or the action of lime; by time, however, and the direct rays of the sun they are somewhat darkened, and by burning are converted into light reds. They are among the most ancient of pigments, may all be produced artificially in endless variety as they exist in nature, and iron is the principal colouring matter in them all. The following are the principal species, but they are often confounded :—

OXFORD OCHRE

Is a native pigment from the neighbourhood of Oxford, semi-opaque, of a warm yellow colour and soft argillaceous* texture, absorbent of water and oil, in both

* Argillaceous, of a clayey character.

which it may be used with safety according to the general character of yellow ochres, of which it is one of the best. Similar ochres are found in the Isle of Wight, in the neighbourhood of Bordeaux, and various other places.

STONE OCHRE

Has been confounded with the above, which it frequently resembles, as does also Roman ochre. True stone ochres are found in balls or globular masses of various sizes in the solid body of stones, lying near the surface of rocks among the quarries in Gloucestershire and elsewhere. These balls are of a smooth compact texture, in general free from grit, and of a powdery fracture. They vary exceedingly in colour, from yellow to brown, murrey, and grey, but do not differ in other respects from the preceding, and may be safely used in oil or water in the several modes of painting, and for browns and dull reds in enamel. Varieties of ochrous colours are produced by burning and compounding with lighter, brighter, and darker colours, but often very injuriously, and adversely to the certainty of operation, effect, and durability.

ROMAN OCHRE

Is rather deeper and more powerful in colour than the above, but in other respects differs not essentially from them;—a remark which applies equally to yellow ochres of other denominations. There are ochres of every country.

BROWN OCHRE,

Spruce Ochre, or *Ocre de Rue*, is a dark-coloured yellow ochre, in no other respects differing from the preceding:—it is much employed, and affords useful and permanent tints. This and all natural ochres require grinding

and washing over to separate them from extraneous substances, and they acquire depth and redness by burning. They form with Prussian blue a variety of greens, and are of use in mixture of other colours.

TERRA DI SIENNA, OR RAW SIENNA,

Is also a ferruginous* native pigment, and appears to be an iron ore, which may be considered as a crude natural yellow lake, firm in substance, of a glossy fracture, and very absorbent. It is in many respects a valuable pigment, — of rather an impure yellow colour, but has more body and transparency than the ochres; and being little liable to change by the action of either light, time, or impure air, it may be safely used according to its powers, either in oil or water, and in all the modes of practice. By burning it becomes deeper, orange, and more transparent and drying. See *Burnt Sienna Earth* (page 66). It is a valuable colour in graining.

IRON YELLOW,

Jaune de Fer, or *Jaune de Mars*, &c., is a bright iron ochre, prepared artificially, of the nature of Sienna earth. In its general qualities it resembles the ochres, with the same eligibilities and exceptions, but is more transparent. The colours of iron exist in endless variety in nature, and are capable of the same variation by art, from sienna yellow, through orange and red, to purple, brown, and black, among which are useful and valuable distinctions, which are brighter and purer than native ochres. They were formerly introduced by the author, and have been lately received under the names of *orange de mars*, *rouge de mars*, *brun de mars*, names which have the merit at least of not misleading

* Ferruginous (Lat. *ferrum*, "iron"), impregnated with iron.

the judgment. When carefully prepared, these pigments dry well in proportion to their depth, and have the general habits of sienna earths and ochres

YELLOW ORPIMENT,

Or *Yellow Arsenic*, is a sulphuretted oxide of arsenic, of a beautiful, bright, and pure yellow colour, not extremely durable in water, and less so in oil: in tint with white lead it is soon destroyed. It is not subject to discoloration in impure air. This property is not, however, sufficient to redeem it with the artist, as it has a bad effect upon several valuable colours, such as Naples yellow; and upon the Chromates, Masticot, and Red lead, and most other oxides and metallic colours; but with colours dependent upon sulphur or other inflammables for their hues it may be employed with less danger, and was probably so employed by the old painters, with ultramarine in the composition of their greens; and is well suited to the factitious or French ultramarines. Although this pigment is not so poisonous as white arsenic, it is dangerous in its effect upon health. Yellow orpiment is of several tints, from bright cool yellow to warm orange, the first of which are most subject to change; and it has appeared under various forms and denominations:—these seem to have been used by several of the old masters, with especial care to avoid mixture; and as they dry badly, and the oxides of lead used in rendering oils drying destroy their colour, levigated glass was employed with them as a dryer, or perhaps they were sometimes used in simple varnish. They are found in a native state under the name of *zarnic* or *zarnich*, varying in colour from warm yellow to green. But orpiment, in all its varieties, powerfully deprives other substances of their oxygen, and therefore is subject to change, and to be

changed by, every pigment whose colour depends on that element, and more especially all metallic colours; if employed, they must therefore be so in a pure and unmixed state. See *Orange Orpiment* (page 67).

KING'S YELLOW.

Yellow orpiment has been much celebrated under this name, as it has also under the denomination of—

CHINESE YELLOW,

Which is a very bright sulphuret of arsenic, brought from China.

ARSENIC YELLOW,

Called also *Mineral Yellow*, is prepared from arsenic fluxed with litharge, and reduced to powder. It is much like orpiment in colour, dries better, and, not being affected by lead, is less liable to change in tint. It must not be forgotten that it is poisonous, nor that all arsenic colours are destructive of every tint of colours mixed with white lead.

CADMIUM YELLOW,

Sulphuret of Cadmium. The new metal, cadmium, affords, by precipitation with solution of sulphuretted hydrogen, a bright warm yellow pigment, which passes readily into tints with white lead, appears to endure light, and remains unchanged in impure air; but the metal from which it is prepared being hitherto scarce, it has been little employed as a pigment, and its habits are, therefore, not ascertained.

GAMBOGE,

Or *Gumboge*, is brought principally from Cambaja in India, and is the produce of several kinds of trees. Is

a concrete vegetal substance, of a gum-resinous nature, and beautiful yellow colour, bright and transparent, but not of great depth. When properly used, it is more durable than generally reputed both in water and oil; and conduces, when mixed with other colours, to their stability and durability, by means of its gum and resin. It is deepened in some degree by ammoniacal and impure air, and somewhat weakened, but not easily discoloured, by the action of light. Time effects less change on this colour than on other bright vegetal yellows; but white lead and other metalline pigments injure, and terrene and alkaline substances redden it. It works remarkably well in water, with which it forms an opaque solution, without grinding or preparation, by means of its natural gum; but is with difficulty used in oil, &c., in a dry state. In its natural state it however dries well, and lasts in glazing when deprived of its gum. Glazed over other colours in water, its resin acts as a varnish which protects them; and under other colours its gum acts as a preparation which admits varnishing. It is injured by a less degree of heat than other pigments.

GALL-STONE

Is an animal calculus formed in the gall-bladder, principally of oxen. This concretion varies a little in colour, but is in general of a beautiful golden yellow, more powerful than gamboge, and is highly reputed as a water-colour; nevertheless, its colour is soon changed and destroyed by strong light, though not subject to alteration by impure air.

It is rarely introduced in oil-painting, and is by no means eligible therein.

INDIAN YELLOW

Is a pigment long employed in India under the name *Purree*, but has not many years been introduced generally into painting in Europe. It is imported in the form of balls, and is of a fetid odour. However produced, it appears to be an urio-phosphate of lime, of a beautiful pure yellow colour, and light powdery texture; of greater body and depth than gamboge, but inferior in these respects to gall-stone. Indian yellow resists the sun's rays with singular power in water-painting; yet in ordinary light and air, or even in a book or portfolio, the beauty of its colour is not lasting. It is not injured by foul air, and in oil is exceedingly fugitive, both alone and in tint.

YELLOW LAKE.

There are several pigments of this denomination varying in colour and appearance according to the colouring substances used, and modes of preparation. They are usually in the form of drops, and their colours are in general bright yellow, very transparent, and not liable to change in an impure atmosphere,—qualities which would render them very valuable pigments, were they not soon discoloured, and even destroyed, by the opposite influence of oxygen and light, both in water and oil; in which latter vehicle, like other lakes in general, they are bad dryers, and do not stand the action of white lead or metallic colours. If used, therefore, it should be as simple as possible.

AUREOLIN.

This is a nitrate of Cobalt, and is a very pure and permanent colour. It is as nearly as possible a pure yellow, and is used in water or oil.

DUTCH PINK, ENGLISH AND ITALIAN PINKS,

Are sufficiently absurd names of yellow colours prepared by impregnating whitening, &c., with vegetal yellow tinctures, in the manner of rose pink, from which they borrow their name.

They are bright yellow colours, extensively used in distemper and for paper-staining and other ordinary purposes; but are little deserving attention in the higher walks of art, being in every respect inferior even to the yellow lakes, except the best kinds of English and Italian pinks, which are, in fact, yellow lakes, and richer in colour than the pigments generally called yellow lake.

The pigment called *Stil*, or *Stil de Grain*, is a similar preparation, and a very fugitive yellow, the darker kind of which is called brown-pink.

CHAPTER X.

RED.

Red is the second and intermediate of the primary colours, standing between *yellow* and *blue;* and in like intermediate relation also to *white* and *black*, or light and shade. Hence it is pre-eminent among colours, as well as the most positive of all, forming with yellow the secondary *orange* and its near relatives, scarlet, &c.; and with blue, the secondary *purple* and its allies, crimson, &c. It gives some degree of warmth to all colours, but most to those which partake of yellow.

It is the archeus, or principal colour, in the tertiary

russet; enters subordinately into the two other tertiaries, *citrine* and *olive;* goes largely into the composition of the various hues and shades of the semi-neutral *marrone*, or chocolate, and its relatives, puce, murrey, morello, mordore, pompadour, &c.; and more or less into *browns*, *greys*, and all broken colours. It is also the second power in harmonizing and contrasting other colours, and in compounding *black*, and all neutrals, into which it enters in the proportion of five,—to blue, eight, —and yellow, three.

Red is a colour of double power in this respect also; that in union or connection with yellow it becomes hot and *advancing;* but mixed or combined with blue, it becomes cool and *retiring*. It is, however, more congenial with *yellow* than with blue, and thence partakes more of the character of the former in its effects of warmth, of the influence of light and distance, and of action on the eye, by which the power of vision is diminished upon viewing this colour in a strong light; while, on the other hand, red itself appears to deepen in colour rapidly in a declining light as night comes on, or in shade. These qualities of red give it great importance, render it difficult of management, and require it to be kept in general subordinate in painting; hence it is rarely used unbroken, or as the predominating colour, on which account it will always appear detached or insulated, unless it be repeated and subordinate in a composition. Accordingly, Nature uses red sparingly, and with as great reserve in the decoration of her works as she is profuse in lavishing green upon them; which is of all colours the most soothing to the eye, and the true compensating colour, or contrasting or harmonizing equivalent of red, in the proportional quantity of eleven to five of red, according to surface or intensity; and is, when the red inclines to scarlet or orange, a *blue-*

green; and when it inclines to crimson or purple, is a *yellow-green.*

Red breaks and diffuses with white with peculiar loveliness and beauty; but it is discordant when standing with orange only, and requires to be joined or accompanied by their proper contrast, to resolve or harmonize their dissonance.

In landscapes, &c., abounding with hues allied to green, a red object, properly placed according to such hues in light, shade, or distance, conduces wonderfully to the life, beauty, harmony, and connection of the colouring; and this colouring is the chief element of beauty in floreal nature, the prime contrast and ornament of the green garb of the vegetal kingdom.

Red being the most *positive* of colours, and having the *middle* station of the primaries, while *black* and *white* are the *negative* powers or neutrals of colours, and the *extremes* of the scale,—red contrasts and harmonizes these neutrals; and, as it is more nearly allied to white or light than to black or shade, this harmony is most remarkable in the union or opposition of white and red, and this contrast most powerful in black and red.

As a colour, red is in itself pre-eminently beautiful, powerful, cheering, splendid and ostentatious, and communicates these qualities to its two secondaries, and their sentiments to the mind.

Red, being a primary and simple colour, cannot be composed by mixture of other colours; it is so much the instrument of beauty in nature and art in the colour of flesh, flowers, &c., that good pigments of this genus may of all colours be considered the most indispensable: we have happily, therefore, many of this denomination, of which the following are the principal:—*

* In China, red colour is consecrated to religion, and the mourning worn by children is hempen sackcloth of a bright red. Love always

VERMILION

Is a sulphuret of mercury, which, previous to its being levigated, is called *cinnabar*. It is an ancient pigment, the κιννάβαρι of the Greeks, and is both found in a native state and produced artificially. The Chinese possess a native cinnabar so pure as to require grinding only to become very perfect vermilion, not at all differing from that imported in large quantities from China.

Chinese vermilion is of a cooler or more crimson tone than that generally manufactured from factitious cinnabar in England, Holland, and different parts of Europe. The artificial, which was anciently called *minium*, a term now confined to red lead, does not differ from the natural in any quality essential to its value as a pigment; it varies in tint from dark red to scarlet, and both sorts are perfectly durable and unexceptionable pigments. It is true, nevertheless, that vermilions have obtained the double disrepute of fading in a strong light and of becoming black or dark by time and impure air; but colours, like characters, suffer contamination and disrepute from bad association: it has happened, accordingly, that vermilion which has been rendered lakey or crimson by mixture with lake or carmine has faded in the light, and that when it has been toned to the scarlet hue by red or orange lead it has afterwards become blackened in impure air, &c., both of which adulterations were formerly practised, and hence the ill-fame of vermilion both with authors and artists. We therefore repeat, that neither light,

had a red colour for the symbol of infancy. Cupid is a child; celestial love is represented in Christian symbolism by infant angels. A child was initiated into the great mysteries at Eleusis; he performed a character in the last initiation, which was an emblem of death; he was named the child of the sanctuary; and the boys of the choir are to this day clothed in red.—*Baron F. Portal.*

time, nor foul air effects sensible change in true vermilions, and that they may be used safely in either water, oil, or fresco,—being colours of great chemical permanence, unaffected by other pigments, and among the least soluble of chemical substances.

Good vermilion is a powerful vivid colour, of great body, weight, and opacity; when pure, it will be entirely decomposed and dissipated by fire in a red heat, and is, therefore, in respect to the above mixtures, easily tested.

The name vermilion—derived from *vermiculus* (*vermis*, a worm)—seems to have had its origin in very early days, and would appear to be the scarlet referred to in the Bible (Exod. xxviii. 5), where the colour rendered in the authorised version "scarlet" is in the original Hebrew called "*Tolāath Shani*," *shining worm.*

The term vermiculus, used by the Moors, referred to the insect they called Kermes, and hence it seems the name Kermesino or Cremèsino which has in our time become Crimson.

The following brilliant pigment from iodine has been improperly called vermilion, and, if it should be used to dress or give unnatural vividness to true vermilion, may again bring it into disrepute. When red or orange lead has been substituted for or used in adulterating vermilion, muriatic acid applied to such pigments will turn them more or less white or grey: but pure vermilions will not be affected by the acid, nor will they by pure or caustic alkalis, which change the colour of the reds of iodine. By burning more or less, vermilion may be brought to the colour of most of the red ochres.

IODINE SCARLET

Is a new pigment of a most vivid and beautiful scarlet colour, [illegible] th brilli nev of v rmilion It h

received several false appellations, but is truly an *Iodide or Bi-iodide of mercury*, varying in degrees of intense redness. It has the body and opacity of vermilion, but should be used with an ivory palette-knife, as iron and most metals change it to colours varying from yellow to black. Strong light rather deepens and cools it, and impure air soon utterly destroys its scarlet colour, and even metallizes it in substance. The charms of beauty and novelty have recommended it, particularly to amateurs; and dazzling brilliancy might render it valuable for high and fiery effects of colour, if any mode of securing it from change should be devised; at any rate it should be used pure or alone. By time alone these colours vanish in a thin wash or glaze without apparent cause, and they attack almost every metallic substance, and some of them even in a dry state. When used in water, gum ammoniac appears to secure it from change; and it has been observed that, when gamboge is glazed over it, it preserves its hue with constancy.

RED LEAD,

Minium,* or *Saturine red*, is an ancient pigment, by some old writers confounded with cinnabar, and called *Sinoper* or *Synoper*, is a deutoxide of lead, prepared by subjecting massicot to the heat of a furnace with an expanded surface and free accession of air. It is of a scarlet colour and fine hue, warmer than common vermilion; bright, but not so vivid as the bi-iodide of mercury; though it has the body and opacity of both these pigments, and has been confounded, even in name, with vermilion, with which it was formerly customary to mix it. When pure and alone, light does not affect its colour; but white lead, or any oxide or preparation

* The artificial vermilion used in early manuscripts was termed *Minium*. The name is now, however, used to designate red lead only.

of that metal mixed with it, soon deprives it of colour, as acids do also; and impure air will blacken and ultimately metallize it.

On account of its extreme fugitiveness when mixed with white lead, it cannot be used in tints; but employed, unmixed with other pigments, in simple varnish or oil not rendered drying by any metallic oxide, it may, under favourable circumstances, stand a long time; hence red lead has had a variable character for durability. It is in itself, however, an excellent dryer in oil, and has in this view been employed with other pigments; but, as regards colour, it cannot be mixed safely with any other pigments than the ochres, earths, and blacks in general. Used alone, it answers, however, as a good red paint for common purposes.

RED OCHRE

Is a name proper rather to a class than to an individual pigment, and comprehends *Indian red, light red, Venetian red, scarlet ochre, Indian ochre, redding, ruddle, bole,* &c., besides other absurd appellations, such as *English vermilion* and *Spanish brown*, or *majolica.*

The red ochres are, for the most part, rather hues and tints than definite colours, or more properly classed with the tertiary, semi-neutral, and broken colours; they are, nevertheless, often very valuable pigments for their tints in dead colouring, and for their permanence, &c., in water, oil, crayons, distempers, and fresco, and in a low tone of colouring have the value of primaries. The greater part of them are native pigments, found in most countries, and very abundantly and fine in our own; but some are productions of manufacture, and we have produced them in the variety of nature by art. The following are the most important of these pigments, most of which are available in enamel-painting:—

INDIAN RED,

According to its name, is brought from Bengal, and is a very rich iron ore, hematite, or peroxide of iron. It is an anomalous red, of a purple-russet hue, of a good body, and valued when fine for the pureness and lakey tone of its tints. In a crude state it is a coarse powder, full of extremely hard and brilliant particles of a dark appearance, sometimes magnetic, and is greatly improved by grinding and washing over. Its chemical tendency is to deepen, nevertheless it is very permanent; neither light, impure air, mixture with other pigments, time, nor fire, effecting in general any sensible change in it; and, being opaque, it covers well. This pigment varies considerably in its hues; that which is most rosy being esteemed the best, and affording the purest tints: inferior red ochres have been formerly substituted for it, and have procured it a variable character, but it is now obtained abundantly, and may be had pure of respectable colourmen. *Persian red* is another name for this pigment.

LIGHT RED

Is an ochre of a russet-orange hue, principally valued for its tints. The common light red is brown ochre, burnt, but the principal yellow ochres afford this colour best; and the brighter and better the yellow ochre is from which this pigment is prepared, the brighter will this red be, and the better flesh tints will it afford with white. There are, however, native ochres brought from India and other countries which supply its place, some of which become darkened by time and impure air; but in other respects light red has the general good properties of other ochres, dries admirably, and is much

used both in figure and landscape painting. It affords also an excellent crayon.

Terra puzzoli and carnagione of the Italians differ from the above only in their hue, in which respect other denominations are produced by dressing and compounding.

VENETIAN RED,

Or *Scarlet ochre.* True Venetian red is said to be a native ochre, but the colours sold under this name are prepared artificially from sulphate of iron, or its residuum in the manufacturing of acids. They are all of redder and deeper hues than light red, are very permanent, and have all the properties of good ochres.

Prussian red, English red, Rouge de Mars, are other names for the same pigment, and Spanish red is an ochre differing little from Venetian red.

DRAGON'S BLOOD

Is a resinous substance, brought principally from the East Indies. It is of a warm, semi-transparent, rather dull, red colour, which is deepened by impure air, and darkened by light. There are two or three sorts, but that in drops is the best. White lead soon destroys it, and it dries with extreme difficulty in oil. It is sometimes used to colour varnishes and lackers, being soluble in oils and alcohol; but, notwithstanding it has been recommended as a pigment, it does not merit the attention of the artist. It was anciently called Cinnabar.

LAKE,

A name derived from the *lac* or *lacca* of India, is the cognomen of a variety of transparent red and other coloured pigments of great beauty, prepared for the most part by precipitating coloured tinctures of dyeing

drugs upon alumine and other earths, &c. The lakes are hence a numerous class of pigments, both with respect to the variety of their appellations and the substances from which they are prepared. The colouring matter of common lake is Brazil wood, which affords a very fugitive colour. Superior red lakes are prepared from cochineal, lac, and kermes; but the best of all are are those prepared from the root of the *Rubia tinctoria*, or madder plant. Of the various red lakes the following are the principal:—

All lakes ground in linseed oil are disposed to fatten, or become livery, but ground stiff in poppy oil they keep better for use.

RUBRIC, OR MADDER LAKES.

These pigments are of various colours, of which we shall speak at present of the red or rose colours only; which have obtained, from their material, their hues, or their inventor, the various names of rose rubiate, rose madder, pink madder, and Field's lakes.

The pigments formerly called madder lakes were brick-reds of dull ochrous hues; but for many years past these lakes have been prepared perfectly transparent, and literally as beautiful and pure in colour as the rose; qualities in which they are unrivalled by the lakes and carmine of cochineal. The rose colours of madder have justly been considered as supplying a desideratum, and as the most valuable acquisition of the palette in modern times, since perfectly permanent and transparent reds and rose colours were previously unknown to the art of painting.

These pigments are of hues warm or cool, from pure pink to the deepest rose colour;—they afford the purest and truest carnation colours known; form permanent tints with white lead; and their transparency renders

them perfect glazing or finishing colours. They are not liable to change by the action of either light or impure air, or by mixture with other pigments; but when not thoroughly edulcorated, they are, in common with all lakes, tardy driers in oil, the best remedy for which is the addition of a small portion of japanner's gold-size: or, as they are too beautiful and require saddening for the general uses of the painter, the addition of manganese brown, cappagh brown, or of burnt umber, as was the practice of the Venetian painters in the using of lake, adds to their powers and improves their drying in oils.

Though little known in ordinary painting, they have been established by experience on the palettes of our first masters during nearly half a century. Madder lake may be tested by liquid ammonia in which its colour is *not* soluble as those of other lakes and carmines are.

SCARLET LAKE

Is prepared in form of drops from cochineal, and is of a beautiful transparent red colour and excellent body, working well both in water and oil, though, like other lakes, it dries slowly. Strong light discolours and destroys it both in water and oil; and its tints with white lead, and its combinations with other pigments, are not permanent; yet when well prepared and judiciously used in sufficient body, and kept from strong light, it has been known to last many years; but it ought never to be employed in glazing, nor at all in performances that aim at high reputation and durability. It is commonly tinted with vermilion, which has probably been mixed with lakes at all times to give them a scarlet hue, and add to their body; *Florentine*

lake, Hamburg lake, Chinese lake, Roman and *Venetian lakes,* are but varieties of the same pigment.

LAC LAKE,

Prepared from the *lac* or *lacca* of India, is perhaps the first of the family of lakes, and resembles the former from Cochineal in being the production of similar insects. Its colour is rich, transparent, and deep,—less brilliant and more durable than that of cochineal, but inferior in both these respects to the colours of madder. Used in body or strong glazing, as a shadow colour, it is of great power and much permanence; but in thin glazing it changes and flies, as it does also in tint with white lead.

A great variety of lakes, equally beautiful as those of cochineal, have been prepared from this substance in a recent state in India and China, many of which we have tried, and found uniformly less durable in proportion as they were more beautiful. In the properties of drying, &c., they resemble other lakes.

This appears to have been the lake which has stood best in old pictures, and was probably used by the Venetians, who had the trade of India when painting flourished at Venice. It is sometimes called *Indian lake.*

CARMINE,

A name originally given only to the fine feculences of the tinctures of kermes and cochineal, denotes generally at present any pigment which resembles them in beauty, richness of colour, and fineness of texture: hence we hear of blue and other coloured carmines, though the term is principally confined to the crimson and scarlet colours produced from cochineal, by the agency of tin. These carmines are the brightest and

most beautiful colours prepared from cochineal,—of a fine powdery texture and velvety richness. They vary from a rose colour to a warm red; work admirably; and are in other respects, except the most essential—the want of durability—excellent pigments in water and oil: they have not, however, any permanence in tint with white lead, and in glazing are soon discoloured and destroyed by the action of light, but are little affected by impure air, and are in other respects like the lakes of cochineal; all the pigments prepared from which may be tested by their solubility in liquid ammonia, which purples lakes prepared from the woods, but does not dissolve their colours.

MADDER CARMINE,

Or *Field's carmine,* is, as its name expresses, prepared from madder. It differs from the rose lakes of madder principally in texture, and in the greater richness, depth, and transparency of its colour, which is of various hues, from rose colour to crimson. These in other respects resemble the rubric or madder lakes, and are the only *durable carmines* for painting either in water or oil; for both which their texture qualifies them without previous grinding or preparation.

ROSE PINK

Is a coarse kind of lake, produced by dyeing chalk or whitening with decoction of Brazil wood, &c. It is a pigment much used by paper-stainers, and in the commonest distemper painting, &c., but is too perishable to merit the attention of the artist.

CHAPTER XI.

BLUE.

THE third and last of the primary or simple colours is *blue*, which bears the same relation to shade that yellow does to light; hence it is the most retiring and diffusive of all colours, except purple and black; and all colours have the power of throwing it back in painting, in greater or less degree, in proportion to the intimacy of their relations to light; first white, then yellow, orange, red, &c.

Blue alone possesses entirely the quality technically called *coldness* in colouring, and it communicates this property variously to all other colours with which it happens to be compounded. It is most powerful in a strong light, and appears to become neutral and pale in a declining light, owing to its ruling affinity with black or shade, and its power of absorbing light; hence the eye of the artist is liable to be deceived when painting with blue in too low a light, or toward the close of day, to the endangering of the warmth and harmony of his work.

Blue mixed with yellow forms *green*, and mixed with red it forms *purple;* it characterizes the tertiary *olive*, and is also the prime colour of the neutral *black*, &c., and also of the semi-neutral *greys*, *slate*, *lead colours*, &c.; hence blue is changed in hue less than any colour by mixture with black, as it is also by distance. It enters also subordinately into all other tertiary and broken colours, and, as nearest in the scale to black, it breaks and contrasts powerfully and agreeably with white, as in watchet or pale blues, the sky, &c. It is less active than the other primaries in reflecting light, and therefore sooner disappears by distance

It is an ancient doctrine that the azure of the sky is a compound of light and darkness, and some have argued hence that blue is not a primary colour, but a compound of black and white; but pure or *neutral* black and white compound in infinite shades, all of which are neutral also or *grey*. It is true that a mixture of black and white is of a *cool* hue, because black is not a primary colour, but a compound of the three primary colours in which blue predominates, and this predominance is rendered more sensible when black is diluted with white.

Blue is discordant in juxtaposition with green, and in a less degree so with purple, both which are cool colours, and therefore *blue* requires its contrast, *orange*, in equal proportion, either of service or intensity, to compensate or resolve its dissonances and correct its coldness. Botanists remark that blue flowers are much more rare than those of the other primary colours and their compounds, and hence advise the florist to cultivate blue flowers more sedulously. Artists, too, have sometimes acted upon this principle of the botanist in introducing blue flowers into pictures, preferring therein rareness and novelty to truth and harmony: the artist has, however, more command of his materials than the botanist in resolving a discord;—Nature nevertheless, left to herself, is not long in harmonizing the dissonances men put upon her. Florists may further remark, that *blue flowers* are readily changed by cultivation into red and white, but never into yellow; that *yellow flowers* are as readily converted into red and white, but never into blue; and that *red flowers* are changeable into orange or purple, but never into blue or yellow: the reasons of all which is apparent according to our principles. Nature also regulates the variegation of flowers by the same law of colouring.

Of all colours, except black, blue contrasts white most powerfully. In all harmonious combinations of colours, whether of mixture or neighbourhood, blue is the natural, ruling tone, universally agreeable to the eye when in due relation to the composition, and may be more frequently repeated therein, pure or unbroken, than either of the other primaries. These are, however, matters of taste, as in music, and subject to artificial rules founded on the laws of chromatic combination.

As blue cannot be composed by mixture of other colours, it is an original and primary colour. The paucity of blue pigments, in comparison with those of yellow and red, is amply compensated by their value and perfection; nor is the palette without novelty, nor deficient in pigments of this colour: of which the following comprise all that are in any respect of importance to the painter.*

ULTRAMARINE,

Or *Azure*, is prepared from the lapis lazuli, a precious stone found principally in Persia and Siberia. It is the most celebrated of all modern pigments, and, from its name and attributes, is probably the same as the no less celebrated *Armenian blue*, or *Cyanus*, of the ancients.

Ultramarine has not obtained its reputation upon slight pretensions, being, when skilfully prepared, of the most exquisitely beautiful blue, varying from the

* The Salisbury Breviary contains several miniatures, in which appear biers covered with a blue mortuary cloth. On some others, but more rarely, the pall is red; finally, on one only is the pall red, and the dais which covers the catafalque blue. These two colours, one over the other, indicate divine love raising the soul to immortality. The dais is the emblem of heaven; violet, composed of red and blue, was likewise a mortuary colour. In the same MS. appears a coffin, with a violet pall.—*Baron F. Portal.*

utmost depth of shadow to the highest brilliancy of light and colour,—transparent in all its shades, and pure in its tints. It is of a true medial blue, when perfect, partaking neither of purple, on the one hand, nor of green on the other; it is neither subject to injury by damp and impure air, nor by the intensest action of light; and it is so eminently permanent that it remains perfectly unchanged in the oldest paintings; and there can be little doubt that it is the same pigment which still continues with all its original force and beauty, in the temples of Upper Egypt, after an exposure of at least three thousand years. The ancient Egyptians had, however, other blues, of which we have already mentioned their counterfeit Armenian blue, and several vitreous blues, with which they decorated their figures and mummies.

Ultramarine dries well, works well in oil and fresco, and neither gives nor receives injury from other good pigments. It has so much of the quality of light in it, and of the tint of air,—is so purely a sky colour, and is hence so singularly adapted to the direct and reflex light of the sky, and to become the antagonist of sunshine,—that it is indispensable to the landscape-painter; and it is so pure, so true, and so unchangeable in its tints and glazings, as to be no less essential in imitating the exquisite colouring of nature in flesh and flowers.

To this may be added, that it enters so admirably into purples, blacks, greens, greys, and broken colours, that it has justly obtained the reputation of clearing or carrying light and air into all colours both in mixture and glazing, and a sort of claim to universality throughout a picture.

It is true, nevertheless, that ultramarine is not always entitled to the whole of this commendation, being, as a

precious material, subjected to *adulteration;* and it has been dyed, damped, and oiled to enrich its appearance: but these attempts of fraud may be easily detected, and the genuine may easily be distinguished from the spurious by dropping a few particles of the pigment into lemon-juice or any other acid, which almost instantly destroys the colour of the true ultramarine totally, and without effervescence. Ultramarine has been used in the arts from a very early period, and in the middle ages special stipulations were made in regard to its use in pictures; and it was a punishable offence for painters to use colours of an inferior quality—which, owing to the expensiveness of ultramarine in particular, they were likely to do.

Though unexceptionable as an oil colour, both in solid painting and glazing, it does not work so well as some other blues in water; but when extremely fine in texture, or when a considerable portion of gum, which renders it transparent, can be used with it to give it connection or adhesion while flowing, it becomes a pigment no less valuable in water painting than in oil; very little gum can however be employed with it when its vivid azure is to be preserved, as in illuminated manuscripts and missals.

Pure ultramarine varies in shade from light to dark, and in hue from pale warm azure to the deepest cold blue; the former of which, when impure in colour, is called *ultramarine ashes.*

FACTITIOUS ULTRAMARINE.

French and *German Ultramarine,* a variety of these, English, French, and German, have been before the public under various names. They are in general of deep rich blue colours, darker and less azure than fine ultramarine of the same depths, and answer to the same

acid test, but are variously affected by fire and other agents: none of them, however, possess the merits of genuine ultramarine. Fire generally darkens these colours, but the best way of distinguishing factitious ultramarine from the natural is by the violent effervescence of the former when dropped into nitrous acid. They may be regarded as a great improvement upon the factitious blues of the palette, rivalling in depth, although not equalling in colour, the pure azure of genuine ultramarine, for which in some uses they may be substituted, and are a valuable acquisition in decoration where brilliancy is required.

These manufactured colours become darker when mixed with oil, and when used with gum or size as a medium require great care in mixing, for if too much of the medium be used, the colour dries much darker than the original powder, and, if too little, the blue is not fixed, but rubs off. These colours are largely used in printing, but as their hue is much injured by the yellow tinge of the oil with which they are mixed to form printing ink, it is advisable in fine work, and where purity of colour is required, to print in varnish only, and to dust the powder-blue over the sheets. The work is printed on highly glazed paper, and the colour thus adheres to the varnish only, and when dry the superfluous blue is dusted off.

COBALT BLUE

Is the name now appropriated to the modern improved blue prepared with metallic cobalt, or its oxides, although it properly belongs to a class of pigments including *Saxon blue*, *Dutch ultramarine*, *Thenard's blue*, *Royal blue*, *Hungary blue*, *Smalt*, *Zaffre* or *Enamel blue*, and *Dumont's blue*. These differ principally in their

degrees of purity, and the nature of the earths with which they are compounded.

The first is the finest Cobalt blue, and may not improperly be called a blue lake, the colour of which is brought up by fire, in the manner of enamel blues; and it is, when well prepared, of a pure blue colour, tending neither to green nor purple, and approaching in brilliancy to the finest ultramarine. It has not, however, the body, transparency, and depth, nor the natural and modest hue, of the latter; yet it is superior in beauty to all other blue pigments. Cobalt blue works better in water than ultramarine in general does; and is hence an acquisition to those who have not the management of the latter, and also on account of its cheapness. It resists the action of strong light and acids, but its beauty declines by time and impure air.

It dries well in oil, does not injure or suffer injury from pigments in general, and may be used with a proper flux in enamel painting, and perhaps also in fresco.

Various appellations have been given to this pigment from its preparers and venders, and it has been called *Vienna blue, Paris blue, azure,* and, very improperly, *ultramarine.*

SMALT,

Sometimes called *Azure,* is an impure vitreous cobalt blue, prepared upon a base of silex, and much used by the laundress for neutralising the tawny or Isabella colour of linen, &c., under the name of *Powder-blue.* It is in general of a coarse gritty texture, light blue colour, and little body. It does not work so well as the preceding, but dries quickly, and resembles it in other respects;—it varies, however, exceedingly in its

qualities; and the finer sort, called *Dumont's blue*, which is employed in water-colour painting, is remarkably rich and beautiful.

ROYAL BLUE

Is a deeper coloured and very beautiful smalt, and is also a vitreous pigment, principally used in painting on glass and enamel, in which uses it is very permanent; but in water and oil its beauty soon decays, as is no uncommon case with other vitrified pigments; and it is not in other respects an eligible pigment, being, notwithstanding its beautiful appearance, very inferior to other cobalt blues.

PRUSSIAN BLUE,

Otherwise called *Berlin blue, Parisian blue, Prussiate of Iron,* or *Cyanide of Iron,* is rather a modern pigment, produced by the combination of the prussic or hydrocyanic acid, iron, and alumina. It is of a deep and powerful blue colour, of vast body and considerable transparency, and forms tints of much beauty with white lead, though they are by no means equal in purity and brilliancy to those of cobalt and ultramarine, nor have they the perfect durability of the latter.

Notwithstanding Prussian blue lasts a long time under favourable circumstances, its tints fade by the action of strong light, and it is purpled or darkened by damp or impure air. It becomes greenish also sometimes by a development of the yellow oxide of iron, and it is therefore desirable to add to it a very small quantity of crimson lake, which in a great degree counteracts this tendency. The colour of this pigment has also the singular property of fluctuating, or of going and coming, under some changes of circum

stances; which property it owes to the action and reaction by which it acquires and relinquishes oxygen alternately: and time has a neutralising tendency upon its colour. It must be used carefully in mixing, as it is very powerful, and so much of the colour with which it is to be mixed is often required to produce the desired tint, that a greater quantity is compounded than is wanted at the time, and waste is thus caused. The most advisable plan, say in compounding green, is to place the yellow first on the slab or palette, and to add the blue, little by little, until the exact tint is obtained.

It dries and glazes well in oil, but its great and principal use is in painting deep blues; in which its body secures its permanence, and its transparency gives force to its depth. It is also valuable in compounding deep purples with lake, and is a powerful neutraliser and component of black, and adds considerably to its intensity. It is a pigment much used when mixed with white lead in the common offices of painting, also in preparing blues for the laundress, in dyeing, and in compounding colours of various denominations. *Lime* and *Alkalis* injure or destroy this colour.

ANTWERP BLUE

Is a lighter-coloured and somewhat brighter Prussian blue, or ferro-prussiate of alumine, having more of the terrene basis, but all the other qualities of that pigment, except its depth. *Haarlem blue* is a similar pigment.

INDIGO,

Or *Indian blue*, is a pigment manufactured in the East and West Indies from several plants, but principally from the Anil or Indigofera. It is of various qualities, and has been long known, and of great use in dyeing.

In painting it is not so bright as Prussian blue, but is extremely powerful and transparent; hence it may be substituted for some of the uses of Prussian blue as the latter now is for indigo. It is of great body, and glazes and works well both in water and oil. Its relative permanence as a dye has obtained it a false character of extreme durability in painting, a quality in which it is nevertheless very inferior even to Prussian blue.

It is injured by impure air, and, in glazing, some specimens are firmer than others, but not durable; in tint with white lead they are all fugitive: when used, however, in considerable body in shadow, it is more permanent, but in all respects inferior to Prussian blue in painting. *Intense blue* is indigo refined by solution and precipitation, in which state it is equal in colour to Antwerp blue. By this process indigo also becomes more durable, and much more powerful, transparent, and deep. It washes and works admirably in water: in other respects it has the common properties of indigo. We have been assured by an eminent architect, that these blues of indigo have the property of pushing or detaching Indian ink from paper. The same is supposed to belong to other blues; but as this effect is chemical, it can hardly be an attribute of mere colour.

BLUE VERDITER

Is a blue oxide of copper, or precipitate of the nitrate of copper by lime, and is of a beautiful light blue colour. It is little affected by light; but time, damp, and impure air turn it green, and ultimately blacken it,—changes which ensue even more rapidly in oil than water; it is therefore by no means an eligible pigment in oil, and is principally confined to distemper painting and the uses of the paper-stainer, though it has been

found to stand well many years in water-colour drawings and in crayon paintings when preserved dry. It has been improperly substituted for *Bice*.

SAUNDERS BLUE,

A corrupt name, from *Cendres Blues*, the original denomination probably of *ultramarine ashes*, is of two kinds, the natural and the artificial; the artificial is a verditer prepared by lime or an alkali from nitrate or sulphate of copper; the natural is a blue mineral found near copper-mines, and is the same as *Mountain blue*. A very beautiful substance of this kind, a *carbonate of copper*, both blue and green, is found in Cumberland. None of these blues of copper are, however, durable: used in oil, they become green, and, as pigments, are precisely of the character of verditers. *Schweinfurt blue* is a similar pigment.

CÆRULEUM.

This is a preparation from cobalt; it is of a much cooler tone than any other permanent blue, and is useful as a water colour. It has a very dense body, and therefore requires some skill in using. It is not adapted for mixing with oils, as the delicacy of its tone is thus injured.

BICE,

Blue, Bice, Iris, or *Terre Blue*, is sometimes confounded with the above copper blues; but the true bice is said to be prepared from the *lapis Armenius* of Germany and the Tyrol, and is a light bright hue. The true Armenian stone of the ancients was probably the lapis lazuli of later times, and the blue prepared therefrom the same as our ultramarine. Pale ultramarine may well supply the place of this pigment, but copper blues substituted for it are not to be depended on.

Ground smalts, blue verditer, and other pigments have passed under the name of bice; which has, therefore, become a very equivocal pigment, and its name nearly obsolete: nor is it at present to be found in the shops, although much commended by old writers on the art.

CHAPTER XII.

OF THE SECONDARY COLOURS.

ORANGE.

ORANGE is the first of the secondary colours in relation to light, being in all the variety of its hues composed of *yellow* and *red*. A true or perfect orange is such a compound of red and yellow as will neutralise a perfect blue in equal quantity either of surface or intensity, and the proportions of such compound are five of perfect red to three of perfect yellow. When orange inclines to red, it takes the names of *scarlet*, *poppy*, *coquilicot*, &c. In *gold* colour, &c., it leans towards yellow. It enters into combination with green in forming the tertiary *citrine*, and with purple it constitutes the tertiary *russet*: it forms also a series of warm semi-neutral colours with *black*, and harmonizes in contact and variety of tints with *white*.

Orange is an advancing colour in painting:—in nature it is effective at a great distance, acting powerfully on the eye: diminishing its sensibility in proportion to the strength of the light in which it is viewed; and it is of the hue and partakes of the vividness of

sunshine, as it does also of all the powers of its components, red and yellow.*

This secondary is pre-eminently a *warm* colour, being the equal contrast or antagonist in this respect, as it is also in colour, to blue, to which the attribute of *coolness* peculiarly belongs: hence it is discordant when standing alone with yellow or with red, unresolved by their proper contrasts.

In the well-known fruit of the Aurantium, called *orange* from its golden hue, from which fruit this colour borrows its well-adapted name, nature has associated two primary colours with two primary tastes which seem to be analogous; a red and yellow compound colour, with a sweet and acid compound flavour.

The poets confound orange with its ruling colour yellow, and, by a metonymy, use in its place the terms golden, gilding, &c., as gilding sometimes supplies the place of this colour in painting

The list of original orange pigments is so deficient, that in some treatises orange is not even named as a colour, most of them being called reds or yellows: and orange being a colour compounded of red and yellow, the place of original orange pigments may be supplied by mixture of the two latter colours; by glazing one over the other; by stippling, or other modes of breaking and intermixing them in working, according to the nature of the work and the effect required. For reasons before given, mixed pigments are inferior to the simple or homogeneous in colour, working, and other properties: yet some pigments mix and combine more cordially than others. In oil the compounding of colours is more easily effected.

* The Oriflamme was the banner of St. Denis, identical with the Grecian Bacchus or Dionysios in sanctifying the soul. Its colour was purple azured and gold; the two colours producing orange were separated in the Oriflamme, but reunited in its name.—*Baron F. Portal.*

In mixing orange for water-colour painting, care must be taken that the colour is well stirred as each brushful is taken, in order that the two colours may not separate. This is particularly liable to be the case where a mineral and a vegetable colour are thus temporarily combined, as, for instance, vermilion and gamboge; the former of which, being very much heavier than the latter, sinks to the bottom, and the colour on the slab consists as it were of two strata, the lower pure vermilion and the upper simply gamboge. It is better to mix an orange in from two colours having similar bases, as in water colour, from gamboge and lake, &c.; in every case, however, the tint must be constantly stirred.

CHROME ORANGE

Is a beautiful orange pigment, and is one of the most durable and least exceptionable chromates of lead, and not of iron, as it is commonly called, or *Mars Scarlet*—another misnomer of this pigment, which is truly a subchromate of lead.

It is, when well prepared, of a brighter colour than vermilion, but is inferior in durability and body to the latter pigment, being liable to the changes and affinities of the chrome yellows in a somewhat less degree, but less liable to change than the orange oxide of lead. *Laque Mineral* is a French pigment, a species of chromic orange, similar to the above. This name is also given to orange oxide of iron, and *Chromate of Mercury*, which is improperly classed as a red with vermilion; for though it is of a bright ochrous red colour in powder, it is, when ground, of a bright orange ochre colour, and affords, with white, very pure orange-coloured tints. Nevertheless it is a bad pigment, since light soon

changes it to a deep russet colour, and foul air reduces it to extreme blackness.

ORANGE OCHRE,

Called also *Spanish ochre*, &c., is a very bright yellow ochre burnt, by which operation it acquires warmth, colour, transparency, and depth. In colour it is moderately bright, forms good flesh tints with white, dries and works well both in water and oil, and is a very durable and eligible pigment. It may be used in enamel-painting, and has all the properties of its original ochre in other respects.

MARS ORANGE

Is an artificial iron ochre, similar to the above, of which we formerly prepared a variety brighter, richer, and more transparent than the above, and in other respects of the same character; but requiring to be employed cautiously with colours affected by iron, being more chemically active than native ochres, several of which and their compounds become orange by burning.

BURNT SIENNA EARTH

Is, as its name expresses, the *Terra di Sienna* burnt, and is of an orange russet colour. What has been said of orange ochre may be repeated of burnt Sienna earth. It is richer in colour, deeper, and more transparent, and works and dries better than *raw Sienna earth;* but in other respects has all the properties of its parent colour, and is permanent and eligible wherever it may be useful, and valuable in graining. *Light red* and *Venetian red,* before treated of, are also to be considered as impure, but durable orange colours; and several preparations of iron afford excellent colours of this class. Burnt Sienna is the best colour for shading gold. It

works well on gold-leaf, when mixed with a small quantity of prepared ox-gall.

ORANGE LEAD

Is an oxide of lead of a more vivid and warmer colour than *red lead*, but in other respects does not differ essentially from that pigment in its qualification for the palette.

ORANGE ORPIMENT,

Or *Realgar*, improperly called also *Red orpiment*, since it is of a brilliant orange colour, inclining to yellow. There are two kinds of this pigment; the one *native*, the other *factitious;* the first of which is the *sandarac* of the ancients, and is of rather a redder colour than the factitious. They are the same in qualities as pigments, and differ not otherwise than in colour from *Yellow orpiment*, to which the old painters gave the orange hue by heat, and then called it *Alchymy* and *Burnt orpiment*.

ANTIMONY ORANGE

Is a *hydro-sulphuret of antimony* of an orange colour, which is destroyed by the action of strong light. It is a bad dryer in oil, injurious to many colours, and in no respect an eligible pigment either in oil or water.

ANOTTA,

Arnotta, Annotto, Caruera, Chica, Terra Orleana, Roucou, &c., are names of several vegetable substances of an orange red colour, brought from the West Indies; they are soluble in water and spirits of wine, but very fugitive and changeable, and not fit for painting. Anotta is principally used in dyeing, and in colouring cheese. It is also an ingredient in some lackers.

CHAPTER XIII.

OF GREEN.

GREEN, which occupies the middle station in the natural scale of colours and in relation to light and shade, is the second of the secondary colours: it is composed of the extreme primaries, *yellow* and *blue*, and is most perfect in hue when constituted in the proportions of *three* of yellow to *eight* of blue of equal intensities; because such a green will perfectly neutralise and contrast a perfect red in the proportions of *eleven* to *five* either of space or power, as adduced on our scale of Chromatic Equivalents. Of all compound colours, green is the most effective, distinct, and striking, affecting the mind with surprise and delight, when first produced by the mixture of blue and yellow; so dissimilar in its constituents does it appear to the untutored eye. Green, mixed with orange, converts it into the one extreme tertiary, *citrine;* and, mixed with purple, it becomes the other extreme tertiary, *olive:* hence its relations and accordances are more general, and it contrasts more agreeably with all colours, than any other individual colour. It has, accordingly, been adopted with perfect wisdom in nature as the general garb of the vegetable creation. It is, indeed, in every respect a central or middle colour, being the contrast and compensatory of the middle primary, *red,* on the one hand, and of the middle tertiary, *russet,* on the other: and, unlike the other secondaries, all its hues, whether tending to blue or yellow, are of the same denomination.

These attributes of green,* which render it so universally effective in contrasting of colours, cause it also

* In heraldry, sinople (the green of blazonry) also signified love, joy, abundance. "Archbishops," says Anselm, "wear a hat of sinople

to become the least useful in compounding them, and the most apt to defile other colours in mixture; nevertheless it forms valuable semi-neutrals of the *olive* class with *black*, for of such subdued tones are the greens, by which the more vivid hues of nature are contrasted; accordingly, the various greens of foliage are always more or less semi-neutral in colour, declining into *grey*. As *green* is the most general colour of vegetable nature, and principal in foliage, so *red*, its harmonizing colour, and compounds of red, are most general and principal in flowers. *Purple* flowers are commonly contrasted with centres or variegations of bright *yellow*, as *blue* flowers are with like relievings of *orange;* and there is a prevailing hue, or character, in the green colour of the foliage of almost every plant, by which it is harmonized with the colours of its flowers.

The principal discord of green is blue; and when they approximate or accompany each other, they require to be resolved by the apposition of warm colours; and it is in this way that the warmth of distance and the horizon reconcile the azure of the sky with the greenness of the landscape. Its less powerful discord is yellow, which requires to be similarly resolved by a purple red, or its principles. In its tones green is cool or warm, sedate or gay, either as it inclines to blue or to yellow; yet it is in its general effects cool, calm, temperate, and refreshing; and, having little power in reflecting light, is in a mean degree a retiring colour, and readily subdued by distance; for the same reasons it excites the retina less than most colours, and is cool and grateful to the eye. As a colour individually, green is eminently beautiful and agreeable, but it is more particularly so when contrasted with its com-

with interlaced cords of green silk. . . . . Bishops likewise wear a hat of sinople."—*Baron F. Portal.*

pensating colour, red, as it often is in nature, and even in the green leaves and the young shoots of plants and trees; and they are the most generally attractive of all colours in this respect. They are hence powerful and effective colours on the feelings and passions, and require, therefore, to be subdued or toned to prevent excitement and to preserve the balance of harmony in painting.

The number of pigments of any colour is in general proportioned to its importance; hence the variety of greens is very great, though their classes are not very numerous. The following are the principal:—

MIXED GREENS.

Green being a compound of *blue* and *yellow*, pigments of these colours may be used to supply the place of green pigments, by compounding them in the several ways of working; by mixing, glazing, hatching, or otherwise blending them in the proportions of the hues and tints required. In compounding colours, it is desirable not only that they should agree chemically, but that they should also have, as much as may be, the same degree of durability; and in these respects Prussian or Antwerp blue and gamboge form a judicious, though not extremely durable, compound, similar to *Varley's green*, *Hooker's green*, &c., used in water. In common oil painting greens are formed by mixture of the ordinary blue and yellow pigments with additions of white. But these are less durable than the original green pigments prepared from copper, of which there are a great variety. But the yellow ochres with Prussian blue afford more eligible pigments than the brighter mixtures of chrome yellow afford. *Cobalt greens*, *chrome greens*, and *Prussian green* are names for similar mixtur

TERRE-VERTE.

True Terre-Verte is an ochre of a bluish green not very bright, in substance moderately hard, and smooth in texture. It is variously a bluish or grey, coaly clay, combined with yellow oxide of iron or yellow ochre. Although not a bright, it is a very durable pigment, being unaffected by strong light and impure air, and combining with other colours without injury. It has not much body, is semi-transparent, and dries well in oil. There are varieties of this pigment; but the green earths which have copper for their colouring matter are, although generally of brighter colours, inferior in their other qualities, and are not true terre-vertes.

It has been called *Green Bice*, and the greens called *Verona green*, and *Verdetto*, or *Holly green*, are similar native pigments of a warmer colour. These greens are found in the Mendip Hills, France, Italy, and the Island of Cyprus, and have been employed as pigments from the earliest times.

CHROME GREENS,

Commonly so called, are compound pigments, of which chrome yellow is the principal colouring substance. These are also called *Brunswick green*, &c., and are compounds of chromate of lead with Prussian and other blue colours, constituting fine greens to the eye, suitable to some of the ordinary purposes of mechanic art, but unfit for fine art.

There is, however, a true chrome green, or *Native green*, the colouring matter of which is the pure oxide of chrome, and, being free from lead, is durable both against the action of the sun's light and impure air. It is of various degrees of transparency or opacity, and

of several hues more or less warm or cool, which are all rather fine than brilliant greens, and afford pure natural and durable tints. *True Chrome greens* neither give nor receive injury from other pigments, and are eligible for either water or oil painting, in the latter of which they usually dry well. They afford valuable colours also in enamel painting. To this substance it is that the emerald owes its green colour.

COBALT GREENS.

There are two pigments of this denomination—the one a compound of cobalt blue and chromic yellow, which partakes of the qualities of those pigments, and may be formed by mixture,—the other, an original pigment prepared immediately from cobalt, with addition of oxide of iron, or zinc, which is of a pure but not very powerful green colour, and durable both in water and oil, in the latter of which it dries well. *Rinmann's green* is of this kind. Its habits are nearly the same as those of cobalt blue.

COPPER GREEN

Is the appellation of a class rather than of an individual pigment, under which are comprehended *Verdigris, Verditer, Malachite, Mineral green, Green bice, Scheele's green, Schweinfurt* or *Vienna green, Hungary green, Emerald green,* true *Brunswick green, Green lake, Mountain green, African green, French green, Saxon green, Persian green, Patent green, Marine green, Olympian green,* &c. Old authors mention others under the names of individuals who prepare them, such are Verde de Barildo, &c.

The general characteristics of these greens are brightness of colour, well suited to the purposes of house-painting, but not in general adapted to the modesty of

nature in fine art. They have considerable permanence, except from the action of damp and impure air, which ultimately blacken them: to which they have also a tendency by time. They have a good body, and dry well in oil, but, like the whites of lead, are all deleterious substances. We will particularise the principal sorts.

VERDIGRIS,

Or *Viride Æris*, is of two kinds, common or impure, and crystallized or *Distilled Verdigris*, or, more properly, refined verdigris. They are both acetates of copper, of a bright colour inclining to blue. They are the least permanent of the copper greens, soon fading as water-colours by the action of light, &c., and becoming first white, and ultimately black, by damp and foul air. In oil, verdigris is durable with respect to light and air, but moist and impure air changes its colour, and causes it to effloresce or rise to the surface through the oil. It dries rapidly, and might be useful as a siccific with other greens or very dark colours. Fresh ground in varnish it stands better; but is not upon the whole a safe or eligible pigment, either alone or compounded. Vinegar dissolves it, and the solution is used for tinting maps, &c. The addition of refined sugar, with gentle boiling, facilitates the solution and improves the colour.

GREEN VERDITER

Is the same in substance as blue verditer, which is converted into green verditer by boiling. This pigment has the common properties of the copper greens above mentioned, and is sometimes called *Green bice.*

EMERALD GREEN

Is the name of a copper green upon a terrene base. It is the most vivid of this tribe of colours, being rather

opaque, and powerfully reflective of light, and appears to be the most durable pigment of its class. Its hue is not common in nature, but well suited for brilliant works. It works well in water, but with difficulty in oil, and dries badly therein. The only true emerald green is, however, that of chrome, with which metal nature gives the green colour to the emerald.

MINERAL GREEN

Is the commercial name of *Green lakes*, prepared from the sulphate of copper. These vary in hue and shade, have all the properties before ascribed to copper greens, and afford the best common greens; and, not being liable to change of colour by oxygen and light, stand the weather well, and are excellent for the use of the house-painter, &c.: but are less eligible in the nicer works of fine art, having a tendency to darken by time and foul air.

MOUNTAIN GREEN

Is a native carbonate of copper, combined with a white earth, and often striated with veins of mountain blue, to which it bears the same relation that green verditer does to blue verditer; nor does it differ from these and other copper greens in any property essential to the painter. The *Malachite*, a beautiful copper ore, employed by jewellers, is sometimes called *Mountain green*, and *Green bice* is also confounded therewith, being similar substances and of similar use as pigments. It is also called *Hungary green*, being found in the mountains of Kernhausen, as it is also in Cumberland.

SCHEELE'S GREEN

Is a compound oxide of copper and arsenic, or arsenite of copper, named after the justly celebrated chemist

who discovered it. It is variously of a beautiful, light, warm, green colour, opaque, permanent in itself and in tint with white lead, but must be used cautiously with Naples yellow, by which it is soon destroyed. *Schweinfurt green* and *Vienna green* are also names of a fine preparation of the same kind as the above. These pigments are less affected by damp and impure air than the simple copper greens, and are therefore in these respects rather more eligible colours than the ordinary copper greens.

PRUSSIAN GREEN.

The pigment celebrated under this name is an imperfect prussiate of iron, or Prussian blue, in which the yellow oxide of iron superabounds, or to which yellow tincture of French berries has been added, and is not in any respect superior as a pigment to the compounds of Prussian blue and yellow ochre. A better sort of Prussian green is formed by precipitating the prussiate of potash with nitrate of cobalt.

SAP GREEN,

Or *Verde Vessie*, is a vegetable pigment prepared from the juice of the berries of the buckthorn, the green leaves of the woad, the blue flowers of the iris, &c. It is usually preserved in bladders, and is thence sometimes called *Bladder green;* when good, it is of a dark colour and glossy fracture, extremely transparent, and of a fine natural green colour. Though much employed as a water-colour without gum, which it contains naturally, it is a very imperfect pigment, disposed to attract the moisture of the atmosphere, and to mildew; and, having little durability in water-colour painting, and less in oil, it is not eligible in the one, and is totally useless in the other.

Similar pigments, prepared from coffee-berries, and called *Venetian* and *Emerald greens*, are of a colder colour, very fugitive, and equally defective as pigments.

INVISIBLE GREEN.

A good ordinary green of this denomination, for out-of-door painting and fresco, may be prepared by mixture of the yellow ochres with black in small quantities; or by adding black to any of the ordinary green pigments. See *Olive Pigments*.

CHAPTER XIV.

OF PURPLE.

PURPLE, the third and last of the secondary colours, is composed of *red* and *blue*, in the proportions of five of the former to eight of the latter, which constitute a perfect purple, or one of such a hue as will neutralise and best contrast a perfect yellow in the proportions of thirteen to three, either of surface or intensity. It forms, when mixed with its co-secondary colour, green, the tertiary colour, *olive;* and, when mixed with the remaining secondary orange, it constitutes in like manner the tertiary colour, *russet*. It is the coolest of the three secondary colours, and the nearest also in relation to *black* or shade; in which respect, and in never being a warm colour, it resembles blue. In other respects also purple partakes of the properties of blue, which is its ruling colour; hence it is to the eye a most retiring colour, which reflects light little, and declines rapidly in power in proportion to the distance

at which it is viewed, and also in a declining light. It is the most retiring of positive colours.

Next to green, purple is the most generally pleasing of the consonant colours; and has been celebrated as a regal or imperial colour, as much perhaps from its rareness in a pure state, as from its individual beauty. When inclining to the rose, or red, this colour takes the names of *crimson*, &c., as it does those of *violet*, *lilac*, &c., when it inclines toward its other constituent, blue; which latter colour it serves to mellow, or follows well into shade.

The contrast, or harmonizing colour of purple, is yellow on the side of light and the primaries; and it is itself the harmonizing contrast of the tertiary *citrine* on the side of shade, and less perfectly so of the semi-neutral *brown*. Purple, when inclining towards redness, is a regal, magisterial, and pompous colour. In its effects on the mind it partakes principally, however, of the powers of its archeus or ruling colour, blue.

As the extreme primaries, blue and yellow, when either compounded or opposed, afford the most pleasing consonance of the primary colours, so the extremes, purple and orange, afford the most pleasing of the secondary consonances; and this analogy extends also to the extreme tertiary and semi-neutral colours, while the mean or middle colours afford the most agreeable contrasts or harmonies. Purple pigments are rare, and lie under a peculiar disadvantage as to apparent durability and beauty of colour, owing to the neutralising power of yellowness in the grounds upon which they are laid, as well as to the general warm colour of light, and the yellow tendency of almost all vehicles and varnishes, by which this colour is subdued; for the same reason this colour disappears by candle-light.

MIXED PURPLES.

Purple being a secondary colour, composed of *blue* and *red*, it follows of course that any blue and red pigments, which are not chemically at variance, may be used in producing mixed purple pigments of any required hue, either by compounding or grinding them together ready for use, or by combining them in the various modes of operation in painting. In such compounding, the more perfect the original colours are, the better in general will be the purple produced. In these ways, *ultramarine* and the *rose colours of madder* constitute excellent and beautiful purples, which are equally permanent in water and oil, in glazing or in tint, whether under the influence of the oxygenous or the hydrogenous principles of light and impure air, by which colours are subject to change. The blue and red of cobalt and madder afford also good purples. Some of the finest and most delicate purples in ancient paintings appear to have been similarly compounded of *ultramarine* and *vermilion*, which constitute tints equally permanent, but less transparent than the above. Facility of use, and other advantages, are obtained at too great a sacrifice by the employment of perishable mixtures, such as are the carmines and lakes of cochineal with *indigo and other blue colours;* but common purples may be composed of Prussian blue and vermilion with additions of white.

GOLD PURPLE,

Or *Cassius's Purple Precipitate*, is the compound oxide which is precipitated upon mixing the solutions of gold and tin. It is not a bright, but a rich and powerful colour, of great durability, varying in degrees of transparency, and in hue from deep crimson to a murrey or dark purple, and is principally used in miniature. It

may be employed in enamel-painting, works well in water and is an excellent though expensive pigment, but not much used at present, as the madder purple is cheaper, and perfectly well supplies its place.

MADDER PURPLE,

Purple Rubiate, or *Field's Purple*, is a very rich and deep carmine, prepared from madder. Though not a brilliant purple, its richness, durability, transparency, and superiority of colour have given it the preference to the purple of gold preceding, and to burnt carmine. It is a pigment of great body and intensity; it works well, dries and glazes well in oil, and is pure and permanent in its tints, neither giving nor sustaining injury from other colours.

BURNT CARMINE

Is, according to its name, the carmine of cochineal partially charred till it resembles in colour the purple of gold, for the uses of which in miniature and water-painting it is substituted, and has the same properties except its durability; of which quality, like the carmine it is made from, it is deficient, and therefore in this important respect is an ineligible pigment. A durable colour of this kind may, however, be obtained by burning *madder carmine* in a cup over a spirit lamp or otherwise, stirring it till it becomes of the hue or hues required.

PURPLE LAKE.

The best purple lake so called is prepared from cochineal, and is of a rich and powerful colour, inclined to crimson. Its character as a pigment is that of the cochineal lakes already described. It is fugitive both in glazing and tint; but, used in considerable body, as in the shadows of draperies, &c., it will last under

favourable circumstances a long time. Lac lake resembles it in colour, and may supply its place more durably, although not perfectly so.

PURPLE OCHRE,

Or *Mineral Purple*, is a dark ochre, native of the Forest of Dean in Gloucestershire. It is of a murrey or chocolate colour, and forms cool tints of a purple hue with white. It is of a similar body and opacity, and darker colour than *Indian red*, which has also been classed among purples, but in all other respects it resembles that pigment. It may be prepared artificially, and some natural red ochres burn to this colour, which has been employed under the denomination of *Violet de Mars*.

CHAPTER XV.

OF THE TERTIARY COLOURS.

CITRINE.

CITRINE is the first of the tertiary class of colours, or ultimate compounds of the primary triad, *yellow*, *red*, and *blue*; in which *yellow* is the predominating colour, and blue the extreme subordinate; for citrine being an immediate compound of the secondaries, *orange* and *green*, of both which *yellow* is a constituent, the latter colour is of double occurrence therein, while the other two primaries enter singly into the composition of citrine,—its mean or middle hue comprehending eight blue, five red, and six yellow, of equal intensities.

Hence citrine, according to its name, which is the name of a class of colours, and is used commonly for a

dark yellow, partakes in a subdued degree of all the powers of its archeus, yellow; and, in estimating its properties and effects in painting, it is to be regarded as participating of all the relations of yellow. By some this colour is improperly called brown, as almost all broken colours are. The harmonizing contrast of citrine is a *deep purple;* and it is the most advancing of the tertiary colours, or nearest in its relation to light. It is variously of a tepid, tender, modest, cheering character, and expressive of these qualities alike in painting and poetic art. In nature, citrine begins to prevail in landscape before the other tertiaries, as the green of summer declines; and as autumn advances it tends towards its orange hues, including the colours called aurora, chamoise, and others before enumerated under the head of *Yellow.*

To understand and relish the harmonious relations and expressive powers of the tertiary colours, requires a cultivation of perception and a refinement of taste for which study and practice are requisite. They are at once less definite and less generally evident, but more delightful,—more frequent in nature, but rarer in common art, than the like relations of the secondaries and primaries; and hence the painter and the poet afford us fewer illustrations of effects less commonly appreciated or understood.

Original citrine-coloured pigments are not numerous, unless we include several imperfect yellows, which might not improperly be called citrines: the following are, however, the pigments best entitled to this appellation :—

MIXED CITRINE.

What has been before remarked of the mixed secondary colours is more particularly applicable to the

tertiary, it being more difficult to select three homogeneous substances, of equal powers as pigments, than two, that may unite and work together cordially. Hence the mixed tertiaries are still less perfect and pure than the secondaries; and as their hues are of extensive use in painting, original pigments of these colours are proportionately estimable to the artist. Nevertheless, there are two evident principles of combination, of which the artist may avail himself in producing these colours in the various ways of working: the one being that of combining two original secondaries,—*e.g.*, *green and orange* in producing a *citrine;* the other, the uniting the three primaries in such a manner that *yellow* predominates in the case of citrine, and *blue and red* be subordinate in the compound.

These colours are, however, in many cases produced with best and most permanent effect, not by the intimate combination of pigments but by intermingling them, in the manner of nature, on the canvas, so as to produce the effect at a proper distance of a uniform colour. Such is the *citrine* colour of fruit and foliage; on inspecting the individuals of which we distinctly trace the stipplings of orange and green, or yellow, red, and green. Similar beautiful consonances are observable in the *russet* hues of foliage in the autumn, in which purple and orange have broken or superseded the uniform green of leaves: and also in the *olive* foliage of the rose-tree, produced in the individual leaf by the ramification of purple in green. Yet mixed citrines may be compounded safely and simply by slight additions, to an original brown pigment, of that primary or secondary tone which is requisite to give it the required hue, and red and yellow ochres mixed form good common paints of this colour.

BROWN PINK

Is a vegetable lake precipitated from the decoction of French berries and dyeing woods, and is sometimes the residuum of the dyer's vat. It is of a fine, rich transparent colour, rarely of a true brown; but being in general of an orange broken by green, it falls into the class of citrine colours, sometimes inclining to greenness, and sometimes toward the warmth of orange. It works well both in water and oil, in the latter of which it is of great depth and transparency, but dries badly. Its tints with white lead are very fugitive, and in thin glazing it does not stand. Upon the whole, it is more beautiful than eligible.

UMBER,

Commonly called *Raw Umber*, is a natural ochre, abounding with oxide of manganese, said to have been first obtained from ancient Ombria, now Spoleto, in Italy; —it is found also in England, and in most parts of the world; but that which is brought from Cyprus, under the name of Turkish umber, is the best. It is of a brown-citrine colour, semi-opaque, has all the properties of a good ochre, is perfectly durable both in water and oil, and one of the best drying colours we possess, and injures no other good pigment with which it may be mixed. (See *Cappagh Brown*, some specimens of which are of a citrine hue.) Although not so much employed as formerly, umber is perfectly eligible according to its colour and uses, in graining, &c.

Several browns, and other ochrous earths, approach also to the character of citrine; such are the Terre de Cassel, Bistre, &c. But in the confusion of names, infinity of tones and tints, and variations of individual pigments, it is impossible to attain an unexceptionable or universally satisfactory arrangement.

CHAPTER XVI.

OF RUSSET.

THE second or middle tertiary colour, *Russet*, like citrine, is constituted ultimately of the three primaries, *red*, *yellow*, and *blue;* but with this difference, that instead of yellow as in citrine, *red* is the predominating colour in russet, to which yellow and blue are subordinates: for *orange* and *purple* being the immediate constituents of russet, and red being a component part of each of those colours, it enters doubly into their compound in russet, while yellow and blue enter it only singly; the proportions of its middle hue being eight blue, ten red, and three yellow, of equal intensities. It follows that the russet takes the relations and powers of a subdued red; and many pigments and dyes of the latter denomination are in strictness of the class of russet colours: in fact, nominal distinction of colours is properly only relative; the gradation from hue to hue, as from shade to shade, constituting an unlimited series, in which it is literally impossible to pronounce absolutely where any shade or colour ends and another begins.

The harmonizing, neutralising, or contrasting colour of russet is a *deep green;*—when the russet inclines to orange, it is a *grey*, or subdued blue. These are often beautifully opposed in nature, being medial accordances, or in equal relation to light, shade, and other colours, and among the most agreeable to sense.

Russet, we have said, partakes of the relations of red, but moderated in every respect, and qualified for greater breadth of display in the colouring of nature and art; less so, perhaps, than its fellow-tertiaries in proportion

as it is individually more beautiful, the powers of beauty being ever most effective when least obtrusive; and its presence in colour should be principally evident to the eye that seeks it. This colour is warm, complacent, solid, frank, and soothing. Common acceptation substitutes the term brown for russet.

Of the tertiary colours, russet is the most important to the artist; and there are many pigments under the denominations of red purple, &c., which are of russet hues. But there are few true russets, and one only which bears the name: of these are the following:—

MIXED RUSSET.

What has been remarked in the preceding chapter upon the production of mixed citrine colours, is equally applicable in general to the mixed russets: we need not, therefore, repeat it. By the immediate method of producing it materially from its secondaries, orange and purple ochres afford a compound russet pigment of a good and durable colour. Chrome-orange and purple-lake yield a similar but less permanent mixture.

Many other less eligible duple and triple compounds of russet are obvious upon principle, and it may be produced by adding red in due predominance to some browns; thus red and brown ochre duly mixed afford a good ordinary russet paint.

FIELD'S RUSSET,

Or *Madder Brown*, is, as its name indicates, prepared from the *Rubia tinctoria*, or madder-root. It is of a pure, rich, transparent, and deep russet colour, introduced by the author, and is of a true middle hue between orange and purple; not subject to change by the action of light, impure air, time, or mixture of other pigments. It has supplied a great desideratum, and is indispensable

in water-colour painting, both as a local and auxiliary colour, in compounding and producing with yellow the glowing hues of autumnal foliage, &c., and with blue the beautiful and endless variety of greys in skies, flesh, &c. There are three kinds of this pigment, distinguished by variety of hue—russet, or *madder brown*, *orange russet*, and dark russet, or *intense madder brown*; which differ not essentially in their qualities as pigments, but as warm or cool russets, and are all good glazing colours, thin washes of which afford pure flesh-tints in water. The last dries best in oil, the others but indifferently. It is a valuable pigment in the graining of mahogany.

PRUSSIATE OF COPPER

Differs chemically from Prussian blue only in having copper instead of iron for its basis. It varies in colour from russet to brown, is transparent and deep, but being very liable to change in colour by the action of light and by other pigments, has been very little employed by the artist.

There are several other pigments which enter imperfectly into, or verge upon, the class of russet, which, having obtained the names of other classes to which they are allied, will be found under other heads; such are some of the ochres and Indian red. Burnt carmine and Cassius's precipitate are often of the russet hue, or convertible to it by due additions of yellow or orange; as burnt Sienna earth and various browns are, by like additions of lake or other reds.

RUSSET OCHRE.

Although there is no pigment of this name in the shops, many of the native ochres are of this denomination of colour, and may be employed accordingly; and

the red and yellow ochres of commerce ground together and burnt afford excellent russet colours in every mode of painting.

CHAPTER XVII.

OF OLIVE.

OLIVE is the third and last of the tertiary colours, and nearest in relation to shade. It is constituted, like its co-tertiaries, citrine and russet of the three primaries, *blue*, *red*, and *yellow*, so subordinated, that blue prevails therein; but it is formed more immediately of the secondaries, *purple* and *green*: and, since blue enters as a component principle into each of these secondaries, it occurs twice in the latter mode of forming olive, while red and yellow occur therein singly and subordinately. *Blue* is, therefore, in every instance, the archeus, or predominating colour of olive; its perfect or middle hue comprehending SIXTEEN of blue to FIVE of red, and THREE of yellow; and it participates in a proportionate measure of the powers, properties, and relations of blue: accordingly, the antagonist, or harmonizing contrast of olive, is a *deep orange;* and, like blue also, it is a retiring colour, the most so of all the colours, being nearest of all in relation to *black*, and last of the regular distinctions of colours. Hence its importance in nature and painting is almost as great as that of black: it divides the office of clothing and decorating the general face of nature with green and blue; with both which, as with black and grey, it enters into innumerable compounds and accordances, changing its name, as either hue predominates, into *green*, *grey*, *ashen*, *slate*, &c.:

thus the olive hues of foliage are called *green*, and the purple hues of clouds are called *grey*, &c., for language is general only, and inadequate to the infinite particularity of nature and colours.

As olive is usually a compound colour both with the artist and mechanic, and as there is no natural pigment in use under this name, or of this colour, in commerce there are few olive pigments. *Terre-vert*, already mentioned, is sometimes of this class, and several of the copper greens acquire this hue by burning. The following need only to be noticed :—

MIXED OLIVE

May be compounded in several ways; directly, by uniting *green* and *purple*, or by adding to *blue* a smaller proportion of *yellow* and *red*, or by breaking much blue with little orange. Cool black pigments mixed with yellow ochre afford good olives. These hues are called *green* in landscape, and *invisible green* in mechanic painting.

OLIVE GREEN.

The fine pigment sold under this name, principally as a water-colour, is an arbitrary compound, or mixed green, eligible for its uses. Any ordinary green mixed with black forms this colour for exterior painting in oil, &c. And an olive-green paint may be economically prepared by the mixing of yellow or brown ochre with black, which may be varied by additions of blue or green.

BURNT VERDIGRIS

Is what its name expresses, and is an olive-coloured oxide of copper deprived of acid. It dries remarkably well in oil, and is more durable; and, in other respects, an improved and more eligible pigment than the

original verdigris. Scheele's green affords by burning also a series of similar olive colours, which are as durable as their original pigment, and most of the copper greens may be subjected to the same process with the same results; indeed, we have remarked in many instances that the action of fire anticipates the effects of long-continued time, and that many of the primary and secondary colours may, by different degrees of burning, be converted into their analogous secondary and tertiary, or semi-neutral colours, that come usefully into the graining of rosewood, &c.

CHAPTER XVIII.

OF SEMI-NEUTRAL COLOURS.

BROWN.

As colour, according to the regular scale descending from *white*, properly ceases with the class of *olive*, the neutral *black* would here naturally terminate the series; but as, in a practical view, every coloured pigment, of every class or tribe, combines with black as it exists in pigments, a new series or scale of coloured compounds arises, having black for their basis, which, though they differ not theoretically from the preceding order inverted, are nevertheless practically imperfect or impure; in which view, and as compounds of black, we have distinguished them by the term *semi-neutral*, and divided them into three classes, Brown, Marrone, and Grey. Inferior as the semi-neutral are in point of colour, they comprehend, nevertheless, a great proportion of our most permanent pigments; and are, with respect to

black, what *tints* are with respect to white, *i.e.*, they are, so to call them, black tints, or shades.

The first of the semi-neutral, and the subject of the present chapter, is BROWN, which, in its widest acceptation, has been used to comprehend vulgarly every denomination of dark broken colour, and, in a more limited sense, is the rather indefinite appellation of a very extensive class of colours of warm or tawny hues. Accordingly we have browns of every denomination of colours except blue; thus we have yellow-brown, red-brown, orange-brown, purple-brown, &c., but it is remarkable that we have, in this sense, no blue-brown nor any other coloured-brown, in any but a forced sense, in which blue predominates; such predominance of a cold colour immediately carrying the compound into the class of grey, ashen, or slate-colour. Hence brown comprehends the hues called feuillemort, mort d'ore, dun, hazel, auburn, &c.; several of which we have already enumerated as allied to the tertiary colours.

The term *brown*, therefore, properly denotes a warm, broken colour, of which *yellow* is a principal constituent: hence brown is in some measure to shade what yellow is to light, and warm or ruddy browns follow yellows naturally as shading or deepening colours. It is hence also that *equal quantities* of either of the three primaries, the three secondaries, or the three tertiaries, produce variously a brown mixture, and not the neutral black, &c.; because no colour is essentially single, and warmth belongs to two of the primaries, but coldness to blue alone. Browns contribute to coolness and clearness by contrast when opposed to pure colours: hence their vast importance in painting and the necessity of keeping them from other colours, to which they give foulness in mixture.

The tendency in the compounds of colours to run into brownness and warmth is one of the general natural properties of colours, which occasions them to deteriorate or dirt each other in mixture: hence *brown* is synonymous with foul or defiled, in a sense opposed to *fair* and pure; and it is hence, also, that brown, which is the nearest of the semi-neutrals in relation to light, is to be avoided in mixture with light colours.

This tendency will account also for the use of brown in harmonizing and toning, and for the great number of natural and artificial pigments and colours we possess under this denomination: in fact, the failure to produce other colours chemically or by mixture is commonly productive of a brown; yet are fine transparent browns obviously very valuable colours. If red or blue be added to brown predominantly, it falls into the other semi-neutral classes, marrone or grey.

The wide acceptation of the term brown has occasioned much confusion in the naming of colours, since broken colours in which red, &c., predominate, have been improperly called brown; and a tendency to red or hotness in browns obtains for them the reproachful appellation of *foxiness*. This term, brown, should therefore, be confined to the class of semi-neutral colours compounded of, or of the hues of, either the *primary yellow, the secondary orange, or the tertiary citrine, with a black pigment;* the general contrast or harmonizing colour of which will consequently be more or less purple or grey; and with reference to black and white, or light and shade, it is of the semi-neutrals the nearest in accordance with white and light.

Brown is a sober and sedate colour, grave and solemn but not dismal, and contributes to the expression of strength, stability, and solidity, vigour, and warmth, and in minor degree to the serious, the sombre, and the sad.

The list of brown pigments is very long, and that of MIXED BROWNS literally endless, it being obvious that every warm colour mixed with black will afford a brown, and that equal portions of the primaries, secondaries, or tertiaries will do the same: hence there can be no difficulty in producing them by mixture when required, which is seldom, as there are many browns which are good and permanent pigments; among these are the following:—

VANDYKE BROWN.

This pigment, hardly less celebrated than the great painter whose name it bears, is a species of peat or bog earth of a fine, deep, semi-transparent brown colour. The pigment so much esteemed and used by Vandyke is said to have been brought from Cassel; and this seems to be justified by a comparison of *Cassel-earth* with the browns of his pictures. The Vandyke browns in use at present appear to be terrene pigments of a similar kind, purified by grinding and washing over: they vary sometimes in hue and in degrees of drying in oil, which they in general do tardily, owing to their bituminous nature, but are good browns of powerful body, and are durable both in water and oil. The *Campania brown* of the old Italian painters was a similar earth.

MANGANESE BROWN

Is an oxide of manganese, of a fine, deep, semi-opaque brown of good body, which dries admirably well in oil. It is deficient in transparency, but may be a useful colour for glazing or lowering the tone of white without tinging it, and as a local colour in draperies, dead colouring, &c. It is a perfectly durable colour both in water and oil.

CAPPAGH BROWN,

Or *Euchrome*, is a *Native Manganese Brown*, found on the estate of Lord Audley, at Cappagh, near Cork. It is a bog-earth or peat, mixed or mineralized by manganese in various proportions. The specimens in which the peat earth most abounds are of light weight, friable texture, and dark colour; those which contain more of the metal are heavy and of a lighter colour.

As pigments, the peaty Cappagh brown is the most transparent, deep and rich in colour, and dries promptly in oil, during which its surface rivels where it lies thick. This may be regarded as a superior Vandyke brown and Asphaltum.

The other and metallic sort is a less transparent, lighter, and warmer brown pigment, which dries rapidly and smoothly in a body or thick layer, and is a superior Umber. They do not keep their place while drying in oil by fixing the oil, like the dryers of lead, but run. The two extreme sorts should be distinguished as *light* and *deep* Cappagh browns; the first excellent for dead colouring, and grounds, the latter for glazing and graining. These pigments are equally applicable to painting in water, oil, and varnish, working well in each of these vehicles. They have been introduced into commerce for civil and marine painting under the names of *Euchrome* and *Mineral brown*, and have been called Caledonian, but are more properly Hibernian, browns, and are fine colours and valuable acquisitions in all their uses, and especially so in the graining of oak, &c.

BURNT UMBER

Is the fossil pigment called Umber, burnt, by which it becomes of a deeper and more russet hue. It contains manganese and iron, and is very drying in oil, in which

it is employed as a dryer. It may be substituted for Vandyke brown, is a perfectly durable and eligible pigment in water, oil, and fresco, and may be produced artificially. The old Italians called it *falsalo.*

CASSEL EARTH,

Or, corruptly, *Castle earth.* The true *terre de Cassel* is an ochrous pigment similar to the preceding, but of a brown colour, more inclined to the russet hue. In other respects it does not differ essentially from Rubens and Vandyke browns.

COLOGNE EARTH,

Incorrectly called *Cullen's earth,* is a native pigment, darker than the two last, and in no respect differing from Vandyke brown in its uses and properties as a colour. Similar earths abound in our own country. They are all bituminous ochres.

RUBENS' BROWN.

The pigment still in use in the Netherlands under this appellation is an earth of a lighter colour and more ochrous texture than the Vandyke brown of the London shops; it is also of a warmer or more tawny hue than the latter pigment, and is a beautiful and durable brown, which works well both in water and oil, and much resembles the brown used by Teniers.

BROWN OCHRE.

See *Yellow Ochre. Iron Brown, Brun de Mars,* and *Prussian Brown* may be regarded as various kinds of brown ochre, of which there is abundance in nature, and all imitable by art. See *Spanish Brown,* or *Tiver,* and *Red Ochre.*

BONE BROWN

And *Ivory Brown* are produced by torrefying, or roasting, bone and ivory till by partially charring they become of a brown colour throughout. They may be made to resemble the five first browns above by management in the burning; and though much esteemed by some artists, are not perfectly eligible pigments, being bad dryers in oil; and their lighter shades not durable either in oil or water when exposed to the action of strong light, or mixed in tint with white lead. The palest of these colours are also the most opaque: the deepest are more durable, and most so when approaching black.

ASPHALTUM,

Called also *Bitumen, Mineral Pitch, Jews' Pitch,* &c., is a resinous substance rendered brown by the action of fire, natural or artificial. The substances employed in painting under this name are residua of the distillation of various resinous and bituminous matters in preparing their essential oils, and are all black and glossy, like common pitch, which differs from them only in having been less acted upon by fire, and in thence being softer. Asphaltum is principally used in oil-painting; for which purpose it is first dissolved in oil of turpentine, by which it is fitted for glazing and shading. Its fine brown colour and perfect transparency are lures to its free use with many artists, notwithstanding the frequent destruction which awaits the work on which it is much employed, owing to its disposition to contract and crack by changes of temperature and the atmosphere; but for which it would be a most beautiful, durable, and eligible pigment. The solution of asphaltum in turpentine, united with drying oil, by heat, or

the bitumen torrefied and ground in linseed or drying-oil, acquires a firmer texture, but becomes less transparent, and dries with difficulty. If also common asphaltum, as usually prepared with oil of turpentine, be used with some addition of Vandyke brown, umber, or Cappagh brown ground in drying-oil, it will acquire body and solidity which will render it much less disposed to crack, and give it the qualities of native asphaltum; nevertheless, asphaltum is to be regarded in practice rather as a dark varnish than as a solid pigment, and all the faults of a bad varnish are to be guarded against in employing it. This pigment is now prepared in excessive abundance, as a product of the distillation of coal at the gas manufactories.

The native bitumen, Asphaltum, brought from Persia by Lieutenant Ford, had a powerful scent of garlic when rubbed. In the fire it softened without flowing, and burnt with a lambent flame; did not dissolve by heat in oil of turpentine, but ground easily as a pigment in pale drying-oil, affording a fine, deep, transparent brown colour, resembling that of the asphaltum of the shops; dried firmly, nearly as soon as the drying-oil alone, and worked admirably both in water and oil. Asphaltum may be used as a permanent brown in water, and the native kind is also superior to the artificial for this purpose, and would be useful from its transparent richness in graining.

MUMMY,

Or *Egyptian brown*, is also a bituminous substance combined with animal remains, brought from the catacombs of Egypt, where liquid bitumen was employed three thousand years ago in embalming; in which office it has combined, by a slow chemical change, during so many ages, with substances which give it a

more solid and lasting texture than simple asphaltum: but in this respect it varies exceedingly, even in the same subject. Its other properties and uses as a pigment are the same as those of asphaltum, for which it is employed as a valuable substitute, being less liable to crack or move on the canvas. This also may be used, when ground, as a water-colour.

ANTWERP BROWN

Is a preparation of asphaltum ground in strong drying-oil, by which it becomes less liable to crack. See the two last articles. Ochrous bitumens, bituminous coal, jet, and other bituminous substances, afford similar browns. See also *Cappagh Brown*.

BISTRE

Is a brown pigment extracted by watery solution from the soot of wood-fires, whence it retains a strong pyroligneous scent. It is of a wax-like texture, and of a citrine-brown colour, perfectly durable. It has been much used as a water-colour, particularly by the old masters in tinting drawings and shading sketches, previously to Indian ink coming into general use for such purposes. In oil it dries with the greatest difficulty.

A substance of this kind collects at the back of fire-places in cottages where peat is the constant fuel burnt; which, purified by solution and evaporation, affords a fine bistre. Scotch bistre is of this kind. All kinds of bistre attract moisture from the atmosphere.

SEPIA,

Seppia or *Animal Æthiops*. This pigment is named after the Sepia, or *cuttle-fish*, which is called also the *ink-fish*, from its affording a dark liquid, which was used as an ink and pigment by the ancients. From

this liquid our pigment sepia, which is brought principally from the Adriatic, and may be obtained from the fish on our own coasts, is said to be extracted; and it is supposed that it enters into the composition of the *Indian ink* of the Chinese. Sepia is of a powerful dusky brown colour, of a fine texture, works admirably in water, combines cordially with other pigments, and is very permanent.

It is much used as a water-colour, and in making drawings in the manner of bistre and Indian ink; but is not used in oil, in which it dries very reluctantly.

MADDER BROWN.

See Field's *Russet* (page 85). Brown Pink (page 83).

PRUSSIAN BROWN

Is a preparation of Prussian blue, from which the blue colouring principle has been expelled by fire, or extracted by an alkaline ley; it is an orange-brown, of the nature and properties of Sienna earth, and dries well in oil.

CHAPTER XIX.

OF GRAY.

Of the tribe of semi-neutral colours, Gray is the third and last, being nearest in relation of colour to black. In its common acceptation, and that in which we here use it, gray denotes a class of cool cinereous colours, faint of hue; whence we have blue grays, olive grays, green grays, purple grays, and grays of all hues,

in which blue predominates; but no yellow or red grays, the predominance of such hues carrying the compounds into the classes of brown and marrone, of which gray is the natural opposite. In this sense the *semi-neutral* GRAY is distinguished from the *neutral* GREY, which springs in an infinite series from the mixture of the neutral *black* and *white* :—between *grays* and *grey*, however, there is no intermediate, since where *colour* ends in the one, *neutrality* commences in the other, and *vice versâ*;—hence the natural alliance of the semi-neutral gray with black or shade; an alliance which is strengthened by the latent predominance of blue in black, so that in the tints resulting from the mixture of black and white, so much of that hue is developed as to give apparent colour to the tints. This affords the reason why the tints of black and dark pigments are colder than their originals, so much so as in some instances to answer the purposes of positive colours.

The *grays* are the natural cold correlatives, or contrasts, of the warm semi-neutral *browns;* and they are degradations of blue and its allies;—hence *blue* added to brown throws it into or toward the class of grays, and hence grays are equally abundant in nature and necessary in art; for the grays comprehend in nature and painting a widely diffused and beautiful play of retiring colours in skies, distances, carnations, and the shadowings and reflections of pure light, &c.

According to the foregoing relations, grays favour the effects and force of warm colours, which in their turn also give value to grays, and by reconciling opposites give repose to the eye.

A misapplication of colouring, however true—such as looking at nature through a prism and painting its effects—in decorations, is but to produce a fool's

paradise, and to excite wonder and false admiration, in place of true effect, sentiment, and repose.

As blue is the ruling power of all the colours which enter into the composition of grays, the latter partake of the relations and affections of blue. *Grave* sounds, like *grey* colours, are deep and dull; and there is a similarity of these terms in sound, signification, and sentiment, if even they are not of the same etymology: be this as it may, *gray* is almost as common with the poet, and in its colloquial use, as it is in nature and painting. The grays, like the other semi-neutrals, are sober, modest colours, contributing to the expression of cool, gloom, and sadness, bordering in these respects upon the powers of *black*, but aiding the livelier and more cheering expressions of other *colours* by connection and contrast.

MIXED GRAYS

Are formed not only by the compounding of black and white, which yields *neutral greys*, and of black and blue, black and purple, black and olive, &c., which yield the *semi-neutral grays* of clouds, &c., but these may be well imitated by the mixture of russet rubiate, or madder browns, with blues, which form transparent compounds, which are much employed; grays are, however, as above remarked, so easily produced, that the artist will in this respect vary and suit his practice to his purpose. The *lead colours* of common painting are formed by adding black to white lead in oil. They are very useful grounds and dead colourings for greens, &c.

NEUTRAL TINT.

Several mixed pigments of the class of gray colours sold for Neutral tint, variously composed of sepia and indigo or other blues, with madder or other lakes,

are designed for water-colour painting only, in which they are found extremely useful. And here it may be proper to mention those other useful colours, sold under the name of tints, which belong to no particular denomination of pigments; but being compounds, the result of the experience of accredited masters in their peculiar modes of practice, serve to facilitate the progress of their pupils. Such are *Payne's grey*, *Harding's* and *Macpherson's tints*, usually sold ready prepared in cakes and boxes for miniature and water-painting. These are composed of pigments which associate cordially; nevertheless, the artist will in general prefer a dependence upon his own skill for the production of his tints in painting, both in water and oil.

ULTRAMARINE ASHES,

Or *Mineral Gray*, are the recrement of Lapis lazuli from which ultramarine has been extracted, varying in colour from dull gray to blue. Although not equal in beauty, and inferior in strength of colour, to ultramarine, they are extremely useful pigments, affording grays much more pure and tender than such as are composed of black and white, or other blues, and better suited to the pearly tints of flesh, foliage, the grays of skies, and the shadows of draperies, but are not necessary to the ordinary painter, who can form them of cheaper pigments.

PHOSPHATE OF IRON

Is a native ochre, which classes in colour with the deeper hues of ultramarine ashes, and is eligible for all their uses. It has received the appellation of *blue ochre*.

Slate clays and several native earths class with grays; but the colours of the latter are not durable,

as they become brown by the oxidation of the iron they contain.

See *Black Lead*, which forms *grey* tints of greater permanence and purity than the blacks in general use, and it is now employed for this purpose with approved satisfaction by experienced artists.

For various grey tints, see page 25.

CHAPTER XX.

OF THE NEUTRAL.

BLACK.

BLACK is the last and lowest in the series or scale of colours descending—the opposite extreme from white—the maximum of colour. To be perfect it must be neutral with respect to colours individually, and absolutely transparent, or destitute of reflective power in regard to light; its use in painting being to represent shade or depths, of which it is the element in a picture and in colours, as white is of light.

As there is no perfectly pure and transparent black pigment, black deteriorates all colours in deepening them, as it does warm colours by partially neutralising them, but it combines less injuriously with cold colours. Though it is the antagonist or contrast of white, yet added to it in minute portion it in general renders white more neutral, solid, and local, with less of the character of light. Impure black is brown, but black in its purity is a cold colour, and communicates this

property to all light colours; thus it *blues* white, *greens* yellow, *purples* red, and degrades blue and other colours; hence the artist errs who regards black as of nearest affinity to hot and brown colours.

It is the most retiring of all colours, which property it communicates to other colours in mixture. It heightens the effect of warm as well as of light colours by a double contrast when opposed to them, and in like manner subdues that of cold and deep colours; but in mixture or glazing these effects are reversed, by reason of the predominance of cold colour in the constitution of black: having, therefore, the double office of colour and of shade, black is perhaps the most important of all colours to the artist, both as to its use and avoidance.

Black is to be considered as a synthesis of the three primary colours, the three secondaries, or the three tertiaries, or of all these together; and, consequently, also of the three semi-neutrals, and may accordingly be composed of due proportions of either tribe or triad. All antagonist colours, or contrasts, also afford the neutral black by composition; but in all the modes of producing black by compounding colours, blue is to be regarded as its predominating colour, and yellow as subordinate to red, in the proportions, when their hues are true, of eight blue, five red, and three yellow. It is owing to this predominance of blue in the constitution of black, that it contributes by mixture to the pureness of hue in white colours, which in general incline to warmth, and it produces the cool effect of blueness in glazing and tints, or however otherwise diluted or dilated. It accords with the principle here inculcated that, in glass-founding, the oxide of manganese, which affords the *red* hue, and that of cobalt, which affords the *blue*, are added to brown or *yellow* frit to produce a velvety-black glass; and that the

dyer proceeds to dye black upon a deep *blue* basis of indigo, with the *ruddy* colour of madder and the *yellow* of quercitron, galls, sumach, &c.; and experience coincides with principle in these practices, but if the principle be wanting the artist will often fail in his performances.

All colours are comprehended in the synthesis of black; consequently the whole sedative power of colour is comprised in black. It is the same in the synthesis of white; and, with like relative consequence, white comprehends all the stimulating powers of colour in painting. It follows that a little black or white is equivalent to much colour, and hence their use as colours requires judgment and caution in painting; and in engraving, black and white supply the place of colours, and hence a true knowledge of the active or sedative power of every colour is of great importance to the engraver.

By due attention to the synthesis of black it may be rendered a harmonizing medium to all colours, and it gives brilliancy to them all by its sedative effect on the eye, and its powers of contrast; nevertheless, we repeat, as a pigment it must be introduced with caution in painting when *hue* is of greater importance than *shade;* and black pigments produced by charring have a disposition to rise and predominate over other hues, and to subdue the more delicate tints by their chemical bleaching power upon other colours, and their own disposition to turn brown or dusky. And for these reasons deep and transparent colours, which have darkness in their constitution, are better adapted in general for producing true natural and permanent effects.

Black is to be regarded as a compound of all other colours, and the best blacks and neutrals of the painter are those formed with colours of sufficient power and

transparency upon the palette; but most of the black pigments in use are produced by charring, and owe their colour to the carbon they contain: such are *Ivory* and *Bone blacks, Lamp black, Blue black, Frankfort black*, &c. The three first are most in use, and vary according to their modes of preparation or burning; yet fine *Frankfort black*, though principally confined tc the use of the engraver and printer, is often preferable to the others.

Native or *mineral blacks* are heavy and opaque, but dry well.

Black pigments are innumerable: the following are, however, the principal, all of which are permanent colours:—

IVORY BLACK

And *Bone Black* are ivory and bone charred to blackness by strong heat in closed vessels. These pigments vary principally through want of care or skill in preparing them. When well made, they are fine neutral blacks, perfectly durable, and eligible both for oil and water-painting; but when insufficiently burnt they are brown, and dry badly; and when too much burnt, they are cineritious, opaque, and faint in colour. Of the two, ivory affords the best pigment; but bone black is used for general purposes.

LAMP BLACK,

Or *Lamblack*, is a smoke black, being the soot of resinous woods, obtained in the manufacturing of tar and turpentine. It is a pure carbonaceous substance, of a fine texture, intensely black, and perfectly durable, which works well, but dries badly in oil. This pigment may be prepared extemporaneously for water-painting by holding a plate over the flame of a lamp or candle, and adding gum-water to the colour: the nearer the plate

is held to the wick of the lamp, the more abundant and warm will be the hue of the black obtained; at a greater distance it will be more effectually charred and blacker. This is a good substitute for Indian ink, the colouring basis of which appears to be lamp black. The *Nero di foglio* of the Italians is prepared from the smoke of burnt paper.

FRANKFORT BLACK

Is said to be made of the lees of wine from which the tartar has been washed, by burning, in the manner of ivory black. Similar blacks are prepared of *vine twigs and tendrils*, which contain tartar; also from *peach stones*, &c., whence *almond black* and *peach black;* and the Indians employ for the same purpose the *shell of the cocoa-nut:* and inferior Frankfort black is merely the levigated charcoal of woods, of which the hardest, such as box and ebony, afford the best. Fine Frankfort black, though almost confined to copper-plate printing, is one of the best black pigments we possess, being of a fine neutral colour, next in intensity to lamp black, and more powerful than that of ivory. Strong light has the effect of deepening its colour; yet the blacks employed in the printing of engravings have proved of very variable durability. It is probable that this black was used by some of the Flemish painters, and that the pureness of the grays formed therewith is attributable to the property of charred substances to prevent discolourment; although they have not the power of bleaching oils as they have of many other substances.

BLUE BLACK

Is also a well-burnt and levigated charcoal, of a cool, neutral colour, and not differing in other respects from the common Frankfort black above mentioned. Blue

black was formerly much employed in painting, and, in common with all carbonaceous blacks, has, when duly mixed with white, a preserving influence upon that colour in two respects; which it owes, chemically, to the bleaching power of carbon, and, chromatically, to the neutralising and contrasting power of black with white. A superior blue black may be prepared by calcining Prussian blue in a close crucible, in the manner of ivory black; and it has the important property of drying well in oil; innumerable black pigments may be produced in this way by charring.

SPANISH BLACK

Is a soft black, prepared by burning *cork* in the manner of Frankfort and ivory blacks; and it differs not essentially from the former, except in being of a lighter and softer texture. It is subject to the variation of the above charred blacks, and eligible for the same uses. *Paper black*, the *Nero di foglio* of the Italians, often prepared in the same way, much resembles Spanish black, as does also Prussian black prepared by roasting Prussian blue.

MINERAL BLACK

Is a native impure oxide of carbon, of a soft texture, found in Devonshire and Wales. It is blacker than plumbago, and free from its metallic lustre,—is of a neutral colour, greyer and more opaque than ivory black,—forms pure neutral tints,—and being perfectly durable, and drying well in oil, it is valuable in dead-colouring on account of its solid body, as a preparation for black and deep colours before glazing. It would also be the most durable and best possible black for frescoes. *Russian black* is of this class.

MANGANESE BLACK.

The common black oxide of manganese answers to the character of the preceding pigment, and is the best of all blacks for drying in oil without addition, or preparation of the oil. It is also a colour of much body and tinging power.

BLACK OCHRE

Is a variety of the mineral black above, combined with iron and alluvial clay. It is found in most countries, and should be washed and exposed to the atmosphere before it is used. Sea-coal, and innumerable black mineral substances, have been, and may be, employed as succedanea for the more perfect blacks, when the latter are not procurable, which rarely happens.

BLACK CHALK

Is an indurated black clay, of the texture of white chalk, and is naturally allied to the preceding article. Its principal use is for cutting into crayons, which are employed in sketching and drawing.

Fine specimens have been found near Bantry in Ireland, and in Wales, but the Italian has the best reputation. Crayons for these uses are also prepared artificially, which are deeper in colour and free from grit. Charcoal of wood is also cut into crayons for the same purpose, and the charcoals of soft woods, such as lime, poplar, &c., are fittest for this use.

INDIAN INK.

The pigment well known under this name is principally brought to us from China in oblong cakes, of a musky scent, ready prepared for painting in water; in which use it is so well known, and so generally em-

ployed, as hardly to require naming. It varies, however, considerably in colour and quality, and is sometimes, properly, called *China ink*. Various accounts are given by authors of the mode of preparing this pigment, the principal substance or colouring matter of which is a smoke black, having all the properties of our lamp black; and the variety of its hues and texture seems wholly to depend upon the degree of burning and levigating it receives. The pigment known by the name Sepia is supposed to enter into the composition of the better sort. The colour of Indian Ink is improved by the addition of a small quantity of Indigo, and a still smaller portion of Lake, by which its tendency to turn brown is neutralised.

BLACK LEAD,

Plumbago, or *Graphite*, is a native carburet of iron or oxide of carbon, found in many countries, but nowhere more abundantly, or so fine in quality, as at Borrodale in Cumberland, where there are mines of it, from which the best is obtained, and consumed in large quantity in the formation of crayons and the black-lead pencils of the shops, which are in universal use in writing, sketching, designing, and drawing; for which the facility with which it may be rubbed out by Indian rubber or caoutchouc, gutta percha, and the crumb of bread admirably adapts it.

Although not acknowledged as a pigment, its powers in this respect claim a place for it, at least among water-colours; in which way, levigated in gum-water in the ordinary manner, it may be used effectually with rapidity and freedom in the shading and finishing of pencil-drawings, &c., and as a substitute therein for Indian ink. Even in oil it may be useful occasionally, as it possesses remarkably the property of covering.

forms very pure *grey* tints, dries quickly, injures no colour chemically, and endures for ever. These qualities render it the most eligible black for adding to white in minute quantity to preserve the neutrality of its tint.

Although plumbago has usurped the name of *Black Lead*, there is another substance more properly entitled to this appellation, and which may also be safely employed in the same manner, and with like effects as a pigment. This substance is the *Sulphuret of Lead*, either prepared artificially, or as found native in the beautiful lead ore, or *Galena*, of Derbyshire.

CHAPTER XXI.

TABLES OF PIGMENTS, ETC.

As there are circumstances under which some pigments may very properly and safely be used, which under others might prove injurious or destructive to the work, the following Lists or Tables are subjoined, in which they are classed according to various general properties, as guides to a judicious selection. These Tables are the results of direct experiments and observation, and are composed, without regard to the common reputation or variable character of pigments, according to the real merits of the various specimens tried.

As the properties and effects of pigments are much influenced by adventitious circumstances, and are sometimes varied or altogether changed by the grounds on which they are employed, by the vehicles in which they are used, by the siccatives and colours with which they

are mixed, and by the varnishes by which they are covered, these Tables are offered only as approximations to the true characters of pigments and as general guides to right practice

TABLE I.

Of Pigments, the colours of which suffer different degrees of change by the action of light, oxygen, and pure air; but are little, or not at all, affected by shade, sulphuretted hydrogen, damp, and foul air:—

- Yellow
  - Yellow Lake
  - Dutch, English, Italian — Pink
  - Yellow Orpiment
  - King's Yellow
  - Chinese Yellow
  - Gamboge
  - Gallstone
  - Indian Yellow
- Red ...
  - Rose Pink
  - Carmine, Common Florence, Scarlet, Hambro' — Cochineal Lakes
- Blue ...
  - Indigo
  - Intense Blue
  - Antwerp Blue
  - Prussian Blue
- Orange
  - Orange Orpiment
  - Golden Sulphur of Antimony
- Green ...Sap Green
- Purple
  - Purple Lake
  - Burnt Carmine
  - Lac Lake
- Brown
  - Brown Pink
  - Light Bone Brown, &c.

REMARKS.—None of the pigments in this Table are eminent for permanence. No white or black pigment whatever belongs to this class, nor does any tertiary, and a few only of the original semi-neutrals. Most of those included in the list fade or become lighter by time, and also, in general, less bright.

Pigments, the colours of which are little, or not at all, changed by light, oxygen, and pure air; but are

more or less injured by the action of shade, sulphuretted hydrogen, damp, and impure air :—

White: Common White Lead, Flake White, Crems White, Roman White, Venetian White, Blanc d'Argent, Sulphate of Lead	Blue ...: Blue Verditer, Sanders Blue, Mountain Blue, Royal Blue, Smalt and other Cobalt Blues
Yellow: Massicot, Patent Yellow, Jaune Minérale, Chrome Yellow, Naples Yellow	Orange: Orange Lead, Orange Chrome, Chromate of Mercury, Laque Minérale
Red ...: Red Lead, Chrome Red, Dragon's Blood, Iodine Scarlet	Green: Green Verditer, Mountain Green, Common Chrome Green, Mineral Green, Verdigris, and other Copper Greens

Remarks.—Most of our best white pigments are comprehended in this Table, but no black, tertiary, or semi-neutral colour.

Many of these colours, when secured by oils, varnish, &c., may be long protected from change. The pigments of this Table may be considered as more durable than those of the preceding; they are nevertheless ineligible in a water-vehicle, and in fresco; and most of them become darker by time alone in every mode of use.

This list is the opposite of Table I.

TABLE III.

Pigments, the colours of which are subject to change by the action both of light and oxygen, and the opposite powers of sulphuretted hydrogen, damp, and impure air :—

White: Pearl or Bismuth White, Antimony White	Yellow: Turbith Mineral, Patent Yellow

Red ..	Iodine Scarlet Dragon's Blood	Orange	Sulphate of Antimony Anotta Carucru
Blue ..	Royal Blue Prussian Blue Antwerp Blue	Green	Verdigris
		Russet	Prussiate of Copper

REMARKS.—This Table comprehends our most imperfect pigments, and demonstrates how few absolutely bad have obtained currency. Indeed several of them are valuable for some uses, and not liable to sudden or extreme change by the agencies to which they are here subjected. Yet the greater part of them are destroyed by time.

These pigments unite the bad properties of those in the two preceding Tables.

TABLE IV.

Pigments not at all, or little, liable to change by the action of light, oxygen, and pure air; nor by the opposite influences of shade, sulphuretted hydrogen, damp and impure air; nor by the action of lead or iron:—

White	Zinc White Constant, or Barytic White Tin White The Pure Earths
Yellow	Yellow Ochre Oxford Ochre Roman Ochre Sienna Earth Stone Ochre Brown Ochre
Red ..	Vermilion Rubiates, or Madder Lakes Madder Carmines Red Ochre Light Red Venetian Red Indian Red
Blue ..	Ultramarine Blue Ochre
Orange	Orange Ochre Jaune de Mars Burnt Sienna Earth Burnt Roman Ochre Light Red, &c.
Green	Chrome Greens Terre-Verte Cobalt Green
Purple	Gold Purple Madder Purple Purple Ochre
Russet	Russet Rubiate, or Madder Brown Intense Russet

Brown and Semi-neutral	Vandyke Brown Bistre Raw Umber Burnt Umber Cassel Earth Cologne Earth Asphaltum Mummy, &c. Ultramarine Ashes Sepia Manganese Brown Cappagh Brown	Black	Ivory Black Lamp Black Frankfort Black Mineral Black Black Chalk Indian Ink Graphite

REMARKS.—This Table comprehends all the best and most permanent pigments, and such as are eligible for water and oil painting. It demonstrates that the best pigments are also the most numerous, and browns the most abundant, and in these respects stands opposed to the three Tables preceding.

TABLE V.

Pigments subject to change variously by the action of white lead and other pigments, and preparations of that metal:—

Yellow	Massicot Yellow Orpiment King's Yellow Chinese Yellow Gamboge Gall-stone Indian Yellow Yellow Lake Dutch, English, Italian — Pink	Blue	Indigo
Red ..	Iodine Scarlet Red Lead Dragon's Blood Common, Cochineal, Florence, Scarlet, Hambro', Lac — Lakes Carmine Rose Pink	Orange	Orange Lead Orange Orpiment Golden Sulphur of Antimony Anotta, or Roucou Carucru, or Chica
		Green ...	Sap Green
		Purple	Purple Lake Burnt Carmine
		Citrine ..	Brown Pink

REMARKS.—Acetate or sugar of lead, litharge, and oils rendered drying by oxides of lead, are all in some measure destructive of these colours. Light, bright, and tender colours are principally susceptible of change by the action of lead.

The colours of this Table are very various in their modes of change, and thence do not harmonize well by time: it follows, too, that when any of these pigments are employed, they should be used pure or unmixed; and, by preference, in varnish: while their tints with white lead ought to be altogether rejected.

TABLE VI.

Pigments, the colours of which are subject to change by iron, its pigments, and other ferruginous substances:—

White { Sulphate of Lead Blanc d'Argent	Blue .. { Blue Verditer Mountain Blue Intense Blue
Yellow { King's Yellow Patent Yellow Naples Yellow Chinese Yellow	Orange { Golden Sulphur of Antimony
Red .. { Iodine Scarlet Carmine Scarlet Lake	Green { Verdigris Green Verditer
	Russet ...Prussiate of Copper

REMARKS.—Several other delicate pigments are slightly affected by iron and its preparations; and with all such, as also with those of the preceding Table, and with all pigments not well freed from acids or salts, the iron palette knife is to be avoided or used with caution, and one of ivory or horn substituted in its place. Nor can the pigments of this Table be in general safely combined with the ochres. Strictly speaking, that degree of friction which abrades the palette knife in rubbing of pigments therewith is injurious to every bright colour.

TABLE VII.

Pigments more or less transparent, and generally fit to be employed as graining and finishing colours, if not disqualified according to Tables I., II., and III.:—

- **Yellow**
  - Sienna Earth
  - Gamboge
  - Indian Yellow
  - Gallstone
  - Italian, English, Dutch — Pink
  - Yellow Lake
- **Red**
  - Madder Carmine
  - Madder Lakes
  - Lac Lake
  - Carmine
  - Common, Florence, Scarlet, Hambro' — Lakes
  - Dragon's Blood
  - Rose Pink
- **Blue**
  - Ultramarines
  - Cobalt Blue
  - Smalt
  - Royal Blue
  - Prussian Blue
  - Antwerp Blue
  - Intense Blue
  - Indigo
- **Orange**
  - Madder Orange
  - Anotta
  - Burnt Sienna Earth
  - Jaune de Mars
- **Green**
  - Chrome Green
  - Sap Green
  - Prussian Green
  - Terre-Verte
  - Verdigris
- **Purple**
  - Madder Purple
  - Burnt Carmine
  - Purple Lake
  - Lac Lake
- **Citrine**
  - Brown Pink
  - Citrine Lake
- **Russet**
  - Madder Brown
  - Prussiate of Copper
- **Brown**
  - Vandyke Brown
  - Cologne Earth
  - Burnt Umber
  - Bone Brown
  - Asphaltum
  - Mummy
  - Brown Pink
  - Antwerp Brown
  - Bistre
  - Sepia
  - Prussian Brown
- **Gray**....Ultramarine Ashes
- **Black**
  - Ivory Black
  - Bone Black
  - Lamp Black
  - Frankfort Black
  - Blue Black
  - Spanish Black

REMARKS.—This Table comprehends most of the best water-colours; and their most powerful effects in oil-painting are attainable by employing them with

resinous varnishes. Pigments not inserted in this Table may of course be considered of an opposite class, or *opaque* colours; with which, nevertheless, transparent effects in painting are produced by the skill of the artist in breaking and mingling without mixing them, &c.

The great importance of transparent pigments is to unite, and give tone and atmosphere generally, with beauty and life, to solid or opaque colours of their own hues; to convert primary into secondary, and secondary into tertiary colours with brilliancy; to deepen and enrich dark colours and shadows, and to give force and tone to black itself.

TABLE VIII.

Pigments, the colours of which are little or not at all affected by heat or fire:—

White	Tin White Barytic White Zinc White The Pure Earths
Yellow	Naples Yellow Patent Yellow Antimony Yellow
Red.....	Red Ochre Light Red Venetian Red Indian Red
Blue..	Royal Blue Smalt Dumont's Blue and all Cobalt Blues Ultramarine
Orange	Orange Ochre Jaune de Mars Burnt Sienna Earth Burnt Roman Ochre
Green	True Chrome Green Cobalt Green
Purple	Gold Purple Purple Ochre
Brown	Rubens' Brown Burnt Umber Cassel Earth Cologne Earth Antwerp Brown Manganese Brown
Black	Graphite Mineral Black

REMARKS.—Many of the pigments of this Table are available in enamel painting, and most of them are durable in the other modes.

TABLE IX.

Pigments which are little or not at all affected by *lime*, and in various degrees eligible for fresco, distemper, and crayon painting:—

White	Barytic White Pearl White Gypsum, and all pure Earths
Yellow	Yellow Ochre Oxford Ochre Roman Ochre Sienna Earth Stone Ochre Brown Ochre Indian Yellow Patent Yellow Naples Yellow Massicot
Red ..	Vermilion Red Lead Red Ochre Light Red Venetian Red Indian Red Madder Reds
Blue ..	Ultramarine Smalt, and all Cobalt Blues
Orange	Orange Lead Orange Chrome Laque Minérale Orange Ochre Jaune de Mars Burnt Sienna Earth Light Red, &c.
Green	Green Verditer Mountain Green Chrome Green Mineral Green Emerald Green Verdigris and other Copper Greens Terre-Verte Cobalt Green
Purple	Gold Purple Madder Purple Purple Ochre
Brown and Semi-neutral	Bone Brown Vandyke Brown Rubens' Brown Bistre Raw Umber Burnt Umber Cassel Earth Cologne Earth Antwerp Brown Chestnut Brown Asphaltum Mummy Ultramarine Ashes Manganese Brown
Black	Ivory Black Lamp Black Frankfort Black Mineral Black Black Chalk Indian Ink Graphite

REMARKS.—This Table shows the multitude of pigments from which the painters in fresco, scagliola, distemper, and crayons may select their colours; in doing which, however, it will be necessary they should consult the previous Tables respecting other qualities of pigments essential to their peculiar modes of painting, as

these modes are exciting renewed interest in the world of art, tending to their extension in practice, particularly the latter of them.

TABLE X.

HERALDIC COLOURS.

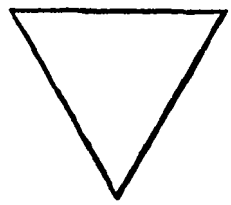
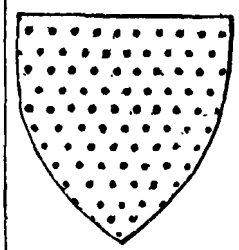
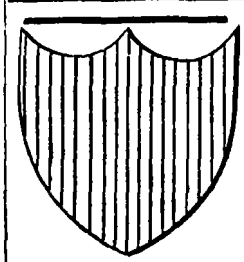
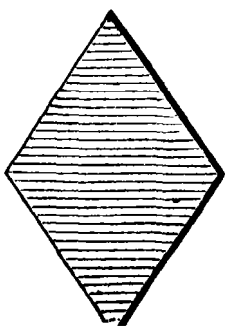
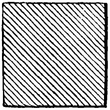
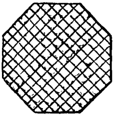
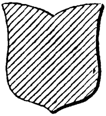
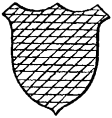
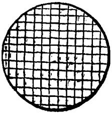
Emblazoned.	Engraved.	Colours.	Gentlemen. Tincture.	Nobles. Jewels.	Sovereign Princes. Planets.	Signs.
	Blank.	White.	Argent.	Pearl.	Luna.	☽
	Dotted.	Yellow.	Or.	Topaz.	Sol.	☉
	Perpendicular lines.	Red.	Gules.	Ruby.	Mars.	♂
	Horizontal lines.	Blue.	Azure.	Sapphire.	Jupiter.	♃

TABLE X. (*continued*).

Emblazoned.	Engraved.	Colours.	Gentlemen.	Nobles.	Sovereign Princes.	Signs.
			Tincture.	Jewels.	Planets	
	Diagonal Dexter.	Green.	Vert.	Emerald.	Venus.	♀
	Diagonal Crossed.	Orange.	Tenne.	Jacynth.	Dragon's Head.	☊
	Diagonal Sinister.	Purple.	Purpure.	Amethyst.	Mercury.	☿
	Horizontal Diagonal.	Murrey.	Sanguin.	Sardonyx.	Dragon's Tail.	☋
	Horizontal Perpendicular.	Black.	Sable.	Diamond.	Saturn.	♄

REMARKS.—Heraldry, the most arbitrary of the sciences, having no foundation whatever in nature, has nevertheless employed colours with more consistent classification than the more natural and legitimate arts, and being intimately connected with decorative painting in the emblazoning of arms and the illuminating of missals, books, deeds, and treaties; and being also of occasional reference to higher art, a brief notice of heraldic colouring and its symbols may be considered as a useful appendage to a work on painting. The present Table may also serve, by the comparison of colours, jewels, &c., to denote the colours themselves, and identify their names according to natural resemblances, and as a guide to the constructing of signals, &c.

The manner of denoting colours by the scoring and crossing of lines on escutcheons may be usefully employed by artists in sketching as memoranda for painting the accidental and local colours of objects.*

* The Cathedral of Chartres offers an example worthy the attention of archæologists: over the grand entrance door, under the rose window, to the right, a stained glass represents the Indian cosmogony, as it is described in the Bhagavadam. On the window of Chartres, Vischnu, draped in blue and red, reposes on a sea of milk, of a yellowish white; above him is the red rainbow: from the bosom of Vischnu issues the white lotus. The upper window represents Brahma with his quadruple face and the crown on his head. Brahma is nearly naked, his skin is bistre or dun; he wears saltirewise a green mantle, which envelopes the lower part of his body; he reposes on the lotus, and in each hand he holds a stem. The upper windows, separated by iron bars, represent corresponding subjects. Finally, on the last and most elevated, Jesus appears, clothed in a blue robe, and wearing a bistre-coloured mantle; above his head descends the Holy Ghost, in the form of a dove. The lotus issuing from the bosom of Vischnu rises up to Jesus Christ, where it appears in full blossom. This window, much anterior to the period of the Renaissance, proves the communication of the Oriental myths at the epoch of the crusades; it unites the symbols of Christian with those of Indian initiation.—*Baron F. Portal.*

CHAPTER XXII.

TABLE XI.

THE PRINCIPAL COLOURS USED IN WATER-COLOUR PAINTING.

THESE may be purchased as moist colours in pans or collapsible tubes, or in whole, half, or quarter cakes.

BLUES.

Prussian Blue	Azure Blue
Indigo	Cobalt
Antwerp Blue	Intense Blue
French Ultramarine	Blue Verditer
Permanent Blue	Cæruleum
Smalt	

REDS.

Carmine	Light Red
Vermilion	Venetian Red
Pure Scarlet	Indian Red
Scarlet Lake	Red Lead
Crimson Lake	Madder Lake
Deep Rose	Pink Madder
Magenta	Rose Madder

YELLOWS.

King's Yellow	Gamboge
Lemon Chrome	Naples Yellow
Middle Chrome	Raw Sienna
Indian Yellow	Yellow Lake
Yellow Ochre	Cadmium Yellow
Orpiment	

PURPLES.

Purple	Purple Madder
Mauve	Dahlia Carmine
Burnt Carmine	Purple Lake
Violet Carmine	

ORANGES.

Orange Chrome	Orange Vermilion
Deep Orange Chrome	Cadmium Orange
Orange Orpiment	Mars Orange

GREENS.

Prussian Green	Emerald Green
Hooker's Green (Nos. 1 & 2)	Olive Green
Sap Green	Terre-Verte
Verdigris	Veronese Green
Green Oxide of Chromium	

BROWNS.

Cologne Earth	Burnt Sienna
Burnt Umber	Brown Madder
Sepia	Brown Pink
Roman Sepia	Raw Umber
Warm Sepia	Brown Ochre
Vandyke Brown	

BLACKS.

Indian Ink (in sticks)	Lamp Black
Ivory Black	Blue Black

WHITES.

Chinese White (in Bottles, &c.)	Flake White
	Permanent White

GREYS.

Neutral Tint	Payne's Grey
Ultramarine Ashes	

REMARKS.—As the whole of the colours named in this Table would never be required by the same artist, each having his especial taste both as to his style of art, and the materials he employs, we give here the contents of small, medium, and full boxes of colours adapted for landscape or landscape and figure:—

LANDSCAPE, 6 CAKE BOX (OR THE SAME COLOURS IN TUBES OR PANS).

Gamboge, Yellow Ochre, Light Red, Crimson Lake, Vandyke Brown, Indigo.

LANDSCAPE AND FIGURE, 7 COLOURS

Gamboge, Raw Sienna, Light Red, Rose Madder, Vandyke Brown, Indigo.

LANDSCAPE, 19 COLOURS.

Gamboge, Yellow Ochre, Lemon Yellow, Pale Cadmium, Deep Cadmium, Chinese Orange, Light Red, Vermilion, Orange Vermilion, Crimson Lake, Rose Madder, Purple Lake, Sepia, Brown Pink, Cobalt Indigo, Cæruleum, Payne's Grey, Terre-Verte.

LANDSCAPE AND FIGURE, 17 COLOURS.

Raw Sienna, Indian Yellow, Lemon Yellow, Italian Pink, Pale Cadmium, Deep Cadmium, Brown Ochre, Burnt Sienna, Scarlet Vermilion, Madder Lake, Indian Lake, Cologne Earth, Vandyke Brown, French Ultramarine, Ultramarine Ash, Indigo, Veronese Green.

LANDSCAPE AND FIGURE, 29 COLOURS.

Gamboge, Yellow Ochre, Raw Sienna, Lemon Yellow, Italian Pink, Indian Yellow, Middle Cadmium, Orange Cadmium, Light Red, Indian Red, Vermilion, Orange Vermilion, Carmine, Rose Madder, Madder Brown, Brown Ochre, Burnt Umber, Sepia, Cobalt, French Ultramarine, Indigo, Emerald Green, Lamp Black, Cæruleum, Ultramarine Ash, Smalt, Purple Madder, Olive Green, Veronese Green.

TABLE XII.

LIST OF POWDER COLOURS FOR PAINTING IN TEMPERA.

Burnt Carmine
Carmine
Deep Rose
Cadmium Yellow
Chinese White
Flake White
Zinc White
Kremnitz White
Crimson Lake
Scarlet Lake
Ultramarine
French Ultramarine
Ultramarine Ash
Green Oxide of Chromium
Indian Lake
Indian Yellow
Intense Blue
Lemon Yellow
Madder Brown
Madder Lake
Madder Purple
Malachite Green
Mars Orange
Mars Yellow
Mineral Grey
Pure Scarlet
Purple Lake
Platina Yellow
Rose Madder Carmine
Rubens' Madder
Smalt
Vermilion
Violet Carmine
Yellow Carmine or Gallstone
Antwerp Blue
Brown Pink
Indian Red
Light Red
Venetian Red
Blue Black
Bone Brown
Cologne Earth
Emerald Green
Ivory Black
Lamp Black
Patent Yellow
Roman Ochre
Vandyke Brown

Indigo	Chrome Yellow (pale) medium and deep
Mummy	Naples Yellow
Italian Pink	Orpiment
Prussian Blue	Raw Sienna
Verdigris	Terre-Verte
Yellow Lake	Yellow Ochre
Burnt Sienna	
Burnt Umber	

Gamboge in Lump—Drop Lake.

REMARKS.—These colours are also used for illumination and for herald painting. For the former, they are either mixed with gum-water, or may be obtained in powder with which gum in a dry condition has already been incorporated—requiring only the addition of water; and the different technical colours used in the latter may be obtained ready mixed in cups.

TABLE XIII.

OIL COLOURS IN METALLIC COLLAPSIBLE TUBES.

Indian Red	Burnt Brown Ochre
Light Red	Burnt Roman Ochre
Venetian Red	Magenta
Indian Lake	Paladium Red
Scarlet Lake	Paladium Scarle
Vermilion	Scarlet Vermilion
Madder Lake	Rose Madder
Carmine, &c.	

BLUES.

Antwerp Blue	Chinese Blue
Permanent Blue	Prussian Blue
Indigo	Cæruleum
Cobalt	French Ultramarine
Ultramarine Ash	

YELLOWS AND ORANGES.

Chrome, Pale	Italian Ochre
Do., Middle	Italian Pink
Do., Deep	King's Yellow
Do., Orange	Naples Yellow, 1, 2, &
Gamboge	Orpiment
Raw Sienna	Patent Yellow
Yellow Ochre	Roman Ochre
Indian Yellow	Mars Yellow
Platina Yellow	Strontian Yellow
Mars Orange	Orange Vermilion
Cadmium Yellow	Cadmium Orange

PURPLES.

Purple Lake	Violet Carmine
Purple Madder	

GREENS.

Emerald Green	[Mineral Green, Nos. 1 & 2
Olive Tint	Terre-Verte
Verdigris	Malachite
Oxide of Chromium	Veronese Green

BLACKS.

Ivory Black	Lamp Black
Blue Black	Black Lead

WHITES.

Flake White	New White
Permanent White	Silver White
Zinc White	

BROWNS.

Asphaltum	Bitumen
Bone Brown	Cappagh Brown
Indian Brown	Manganese Brown
Vandyke Brown	Verona Brown
Brown Ochre	Brown Pink
Burnt Umber	Cassel Earth
Mummy	Raw Umber
Madder Brown	Rubens' Madder
Burnt Sienna	

Mineral Grey, &c., &c.

REMARKS.—These tubes may either be purchased separately or in boxes fitted up for figure-landscape, &c.; or in any way desired by the artist. The student is advised not to purchase a large stock at once, but to obtain just enough for his immediate wants, making additions from time to time according to necessity.

PART III.

ON VEHICLES, OILS, AND VARNISHES.

CHAPTER XXIII.

ON VEHICLES, ETC.

SINCE colours and pigments are liable to material influence, and changes of effect, from the materials employed in painting for tempering, combining, distributing, and securing them on their grounds in the various modes of the art, the powers and properties of oils, vehicles, and varnishes are of hardly less importance than those of colours themselves; they are, therefore, an essential branch of our subject. Vehicles, which term is borrowed from pharmacy, are, indeed, among the chief materials and indispensable means of painting, and give name to its principal modes under the titles of painting, in Water, Oil, Varnish, Distemper and Fresco: we will consider them, therefore, in these respects.

It is observable that the colours of pigments bear out with effects differing according to the liquids with which they are combined, and the substances those liquids hold in solution, which in some instances obscure or depress, and in others enliven or exalt, the colours;

in the first case by the tinge and opacity of the fluid, and in the latter, by its colourless transparency, and sometimes also much more so by a refractive power; as in varnishes made of pure resinous substances, which have a very evident and peculiarly exalting effect upon colours, that continues when they are dry; because resins form a glossy transparent cement, while the media formed by expressed oils become horny, or semi-opaque. This principle applies also to aqueous and spirituous vehicles in water-painting, according to the nature of the substances they may hold in solution.

WATER VEHICLES.

The most natural or fit distribution of vehicles is into those of *water*, *oils*, and *varnishes*; under which heads we proceed to regard them, and the various substances employed as additions, according to the variety of practice.

As the action of AQUEOUS LIQUIDS and solvents upon colours is stronger and more immediate than that of oils and varnishes, it is of great importance to the water-colour painter that he should attend to the pureness of his water, as in all hard and impure waters colours are disposed to separate and curdle, so that it is often impossible a clear flowing wash, or gradation of colour, should be obtained with them.

As water is not sufficient to connect, bear out, and secure colours on their grounds in painting, owing to its entirely evaporating in drying, additions of permanently adhesive substances soluble therein are necessary, such as vegetable gums, mucilages, farinaceous paste, sugar, animal glues and size, glaire or white of eggs, serum of blood, milk, curd, whey, &c., and finally mineral solids, such as quick-lime, alum, borax, &c.,

and these variously mixed and compounded: whence a variety of empirical methods of painting.

Water, as a vehicle compared with *oil*, is of simple and easy use, drying readily, and being subject to little alteration of colour or effect subsequently; for, notwithstanding oils and varnishes are less chemically active upon colours than aqueous fluids, the vehicles of the oil-painter subject him to all the perplexities of their bad drying, change of colour, blooming, and cracking, —to habits varying with a variety of pigments, and to the contrariety of qualities, by which they are required to unite tenuity with strength, and to be fluid without flowing, &c.; to provide for and reconcile all which has continually exercised the ingenuity of the oil-painter.

MUCILAGES.

Gum, or some mucilaginous substance, is a necessary addition to water to give pigments their requisite cohesion, and to attach the colours to the grounds on which they are applied, as well as to give them the property of bearing out to the eye, according to the intention of the artist; upon which, and upon the pigments used, depend the proportions of gum to be employed, gum being a constituent of some pigments, while others are of textures to require it in considerable quantity to give them proper tenacity,—qualities we have adverted to in speaking of individual pigments: as a general rule, however, the proportion of gum, &c., employed with a colour should be sufficient to prevent its abrasion, but not so much as to occasion its scaling or cracking, both of which are easily determined by trial upon paper.

GUMS.

Of *Gums*, SENEGAL is the strongest and best suited to dark colours, being of a brown hue; but the light-

coloured pieces may be employed for the more delicate pigments. All gums contain an acid, very unfavourable to their preservation in a fluid state; which acid requires, therefore, to be neutralised by the addition of some alkaline substance, of which we have found the carbonate of ammonia, being volatile, to be the best; a small portion of which being shaken into the dissolved gum will purify it by precipitating all its foulness, and preserve it a very long time for use, and very much improve the working of colours without occasion for gall: the gum will rarely require more than one scruple of the powdered carbonate to an ounce of the gum dissolved by maceration in two or three ounces of cold water. Solution of borax will answer the same purpose, but less eligibly.

Gum Arabic is in general clearer and whiter than Senegal, and hence is better adapted to the brighter and more delicate colours. It should be picked and purified by solution in cold water, straining, and decanting; and should be used fresh, or preserved by addition of alcohol, or by ammonia in the manner already described.

Ammonia, or *Gum Ammoniac*, is a gum-resin, soluble in spirit and in water, in the latter of which it forms a milky fluid that dries transparent: it has many properties which render it useful in water-painting. It is avoided by insects, is very tenacious, and affords a middle vehicle between oil and water, with some of the advantages of both. It contributes also, in the manner of a varnish, to protect the more fugitive colours over which it may be glazed, or with which it may be mixed, and on this account it is eligible in water-painting.

Gum Tragacanth is a strong colourless gum, soluble in hot water, and of excellent use when colours are

required to lie flat, or not bear out with gloss, and also when a gelatinous texture of the vehicle is of use to prevent the flowing of the colours; *starch* as prepared by the laundress, water in which *rice* has been boiled, used by the Chinese, and *paste* of wheaten flour, are available for the same purpose. *Sugar* and *honey* have also been employed, but as they attract flies and moisture are better avoided.

SIZE

Is prepared either by long boiling the shreds of parchment, &c., or from *glue* by soaking in cold water, and subsequently dissolving by heat. The quantity to be used depends like that of gums on the quality of the pigments employed, and caution is more necessary than with the gums not to use it in excess on account of its disposition to contract in drying, and occasion the colour to crack and scale off. The lighter-coloured *fish-glue* and *isinglass* are substituted for the nicer kinds of painting; *albumen* or *white of egg*, and also the *yolk*, employed by glovers, is used in some cases; *oxgall* is useful when the surface to be painted is polished, or works greasy. Size is sometimes worked into oil colours instead of mastic varnish to gelatinize and give them crispness.

MILK OF LIME

Is commonly employed in distemper painting without size, as a white basis and cement of colours, with or without addition of drying oil, and, when dry, stands weather with considerable firmness. It is prepared by slacking lumps of white quicklime in water.

Is a mild alkaline salt, useful for neutralising the acidity of gums, and as a substitute for animal gall in

attaching colours to polished or oily surfaces. It is also valuable as a *medium* for uniting varnishes and oils with water, in an intermediate mode of painting, which after drying is insoluble in water and may be washed. In small quantity borax promotes the drying of oils.

MEDIA.

Many attempts have been made to unite the advantages of the two modes of painting—of water and oil—either by successive processes, or by the use of a vehicle of a compound or intermediate affinity to both of these fluids, and thence technically denominated a *medium*; a term otherwise properly applicable to every vehicle.

With regard to *media*, all the gelatinous substances before mentioned as additions to water vehicles may be combined with linseed and other oils, and such compounds may be employed as vehicles, and will keep their place as delivered by the brush in painting. Indeed starch, as prepared by the laundress, has been lately recommended for this purpose. Nevertheless we regard these mixtures as both chemically and mechanically inferior to the combination of lac and borax, which is equally diffusible in water and in oil, and does not contract in drying, or render the painting penetrable by moisture as farinaceous and mucilaginous substances do, nor, in the end, dispose the work to crack. It has accordingly been proposed that artists should adopt the Indian process of painting, in which lac is rendered saponaceous and miscible in water by the medium of borax; but against this process the foul colour and opacity of the vehicle have been heretofore justly objected. If, however, one part of borax be dissolved in twelve of boiling water, and the solution be added, in equal or other proportions, to white lac varnish, a perfectly

transparent colourless liquid is formed, which diffuses freely in water, and may be used, with some difficulty, as a quick-drying vehicle for painting instead of oil, and, when dry, is not acted on or removable by water; add to this, that as this lac vehicle is as freely miscible with oil as it is with water, it supplies a true medium, or connecting link, between painting in water and oil, which may, in ingenious hands, unite the advantages of both.

DRYERS,

Or *Siccatives.* With respect to DESICCATION OR DRYING, the well-known additions of the acetate or *sugar of lead*, *litharge*, and *sulphate of zinc*, called also improperly *white copperas* and *white vitriol*, either mechanically ground or in solution, for light colours; and *japanners' gold size*, or oils boiled upon litharge for lakes, or in some cases *verdigris* and *manganese* for dark colours, may be resorted to when the colours or vehicles are not sufficiently good dryers alone: but it requires attention, that an excess of dryer renders oils saponaceous, is inimical to drying, and injurious to the permanent texture of the work. Some colours, however, dry badly from not being sufficiently edulcorated or washed, and many are improved in drying by passing through the fire, or by age. Sulphate of zinc, as a dryer, is less powerful than acetate of lead, but is preferable in use with some colours, upon which it acts less injuriously; but it is supposed, erroneously, to set the colours running; which is not positively the case, though it will not retain those disposed to it, because it wants the property the acetate of lead possesses, of gelatinizing the mixture of oil and varnish. These two dryers should not be employed together, as frequently directed, since they counteract and decompose

each other by double election,—forming two new substances, the acetate of zinc, which is an ill dryer, and the sulphate of lead, which is insoluble and opaque.

It is not always that ill drying is attributable to the pigments or oils;—the states of the weather and atmosphere have great influence thereon. The oxygenating power of the direct rays of the sun renders them peculiarly active in drying oils and colours, and was probably resorted to before dryers were added to oils, and the atmosphere is imbued with the active matter of light to which its drying property may be attributed. The ground may also advance or retard drying, because some pigments, united either by mixing or glazing, are either promoted or obstructed in drying by their conjunction: artificial heat also promotes drying.

The various affinities of pigments occasion each to have its more or less appropriate dryer; and it would be a matter of useful experience if the habits of every pigment in this respect were ascertained; siccatives of less power generally than the above, such as the acetate of copper, *massicot*, *red lead*, and the oxides of manganese, to which *umber* and the Cappagh browns owe their drying quality, and others, might come into use in particular cases. Many other accidental circumstances may also affect drying. Dryers should be added to pigments only at the time of using them; because they exercise their drying property while chemically combining with the oils employed, during which the latter become thick or fatten, and render additional oil and dryer necessary when again used. *Acetate of lead*, dissolved in water, spirit, or turpentine, may be used as a dryer of oil paints with convenience and advantage in some cases.

In the employment of dryers attention is necessary —1. Not to add them uselessly to pigments that dry

well in oil alone. 2. Not to employ them in excess, which retards drying. 3. Not to add them to the colour till it is to be used. 4. Not to add several kinds of dryers to the same colour: and—5. To use simple dryers in preference to nostrums recommended and vended for drying of paints. Impurity of the pigment sometimes retards drying, in which case it should be washed.

Another attention should be, that one coat of paint should be thoroughly dry before another is applied; for if the upper surface of paint dry before the surface beneath it, it will *rival* by the expansion and contraction of the under surface as the oil evaporates and dries; overloading with paint will be attended by the same evil; and if the upper surface be of varnish or brittle, *cracking* of the paint will ensue.

CHAPTER XXIV.

ON OILS, ETC.

Oils are distinguished into *Fat oils*, *Drying oils*, and *Volatile oils*; the two first are also called *fixed and expressed oils*, as the latter are *essential oils*. All oils become thickened by age, and more rapidly so by contact of air and combination with its oxygen; in which case if the oil be fat or unctuous oil, such as olive oil and all animal oils, *stearine*, or tallow, is produced and separated from the *elain*, *olain*, or fluid oil; if it be a drying oil, such as linseed and painter's oil, *caoutchouc* or gluten is, in like manner, produced; and if it be a volatile or essential oil, such as that of turpentine, solid

resin is formed therein: a third and acid substance is formed in oils when they become rancid, called *margarine*, which is inimical to drying. *Wax* is produced by the action of oxygen on a compound fat and essential oil; wax is therefore a substance between resin and stearine or tallow. All these substances may be regarded as oxides of elain, into which oils are wholly convertible; and, finally, by the action of time, air, and heat, they approach an elementary state, suffer incipient combustion, develop hydrogen, and become ultimately carbonized and darkened; in all which states oils are deteriorated for working freely and for painting with pureness and permanence, as the fat oils are for burning in lamps.

All oils are soluble or miscible in water by the medium of alkalis, absorbent earths, or other metallic oxides, and are therefore capable of chemical union with pigments; they are partially soluble also in alcohol, and absorb or take up by agitation small portions of both alcohol and water, which they resign upon being heated.

LINSEED OIL.

Of the expressed or drying oils appropriate to painting "*Honest linseed*" is by far the strongest, and that which dries best, most tenaciously, and firmest under proper management; which properties it owes to its being at once resinous, glutinous, and oleaginous. Having more of the quality of a resin than a fat oil, it never totally loses its transparency while liquid, in the manner of fat oils by cold, but preserves it during the most intense frost in the manner of a resin; and, like the resins also, it becomes ultimately fixed, hard, and solid, by combining with the oxygen of the atmosphere: but it lies under the great disadvantage of acquiring, after drying, and by exclusion from light and pure air, a semi-

opaque and yellow-brown colour, which darkens by age. To obviate this as much as possible, when painting with oil alone, it is best to work the colour as stiff as may be, so as to use as small a portion of the vehicle as may suffice; for it is a fact proved by direct and repeated experiments, that *little oil diffused through much colour is subject to little change* upon the canvas, and that a thin coating of linseed oil is similarly preserved by light and the action of the atmosphere.

Linseed oil varies in quality according to the goodness of the seed from which it is expressed; the best is yellow, transparent, comparatively sweet scented, and has a flavour somewhat resembling that of the cucumber: great consequence has been attributed to the cold-drawing of this oil, but it is of little or no importance in painting whether moderate heat be employed or not in expressing it. Several methods have been contrived for bleaching and purifying this oil, so as to render it perfectly colourless and limpid; but these give it mere beauty to the eye in a liquid state, without communicating any permanent advantage, since there is not any known process for preventing the discolourment we have spoken of as sequent to its drying: and it is perhaps better upon the whole that this and every vehicle should possess that colour at the time of using to which it subsequently tends, that the artist may depend upon the continuance of his tints, and use his vehicle accordingly, than that he should be betrayed by a meretricious and evanescent beauty in his vehicle to use it too freely. Linseed oil that has been long boiled upon litharge in a water-bath, to preserve it from burning, acquires colour; and is, when diluted with oil of turpentine, less disposed to run than pure linseed oil, and affords one of the most eligible vehicles of the oil-painter.

The most valuable qualities of linseed oil, as a vehicle, consist in its great strength and flexibility; some have preferred it when bleached by exposure to sun and air; others, when *new and fresh*, or that which is *cold-drawn;* but that is the best which will temper most colour in painting; and oil expressed with a heat which does not char or much discolour it, is equal in all respects to the cold-drawn.

THE DRYING OF OILS

Appears to depend on the following conditions:—the presence of oxygen which by an incipient combustion of the hydrogenous oils fixes them, whence whatever contributes oxygen to oil dries it, as it is the case with pure air, sunshine, &c. Hence all the perfect oxides of metals, including even pure earths and alkalis in due proportions, dry oils. Hence, imperfect oxides, by abstracting oxygen from oil, retard drying; hydrogenous substances are hence ill dryers in oil, hence the best dryers are those which contain oxygen in excess; and such are litharge, sugar of lead, minium, massicot manganese, umbers, sulphate of zinc or white copperas, and verdigris.

PALE DRYING OIL.

The oil should be macerated, two or three days at least, upon about an eighth of its weight of litharge, in a warm place, occasionally shaking the mixture, after which it should be left to settle and clear; or it may be prepared without heat by levigating the litharge in the oil. Acetate of lead may be substituted for litharge, being soluble with less heat, and its acid being volatile escapes during solution and bleaches the oil; to which coarse smalt may be added to clear it by subsidence, increase its drying, and neutralise its brown colour. This affords *pale drying oil* for light and bright

colours, which may be preserved for use in the above-described apparatus.

BOILED OIL.

The above mixture of oil and litharge, gently and carefully boiled in an open vessel till it thickens, becomes *strong drying oil* for dark colours. Boiled oil is sometimes set on fire purposely in the making of *Printers' Varnish and Printing Ink*, and also for painting and the preparation of JAPANNERS' GOLD SIZE. As dark and transparent colours are in general comparatively ill dryers, *japanners' gold size* is sometimes employed as a powerful means of drying them. This material is very variously and fancifully prepared, often with needless, if not pernicious, ingredients; but may be simply, and to every useful purpose in painting, prepared as follows:—Powder finely of asphaltum, litharge or red lead, and burnt umber, or manganese, each one ounce; stir them into a pint of linseed oil, and simmer the mixture over a gentle fire, or on a sand-bath, till solution has taken place, scum ceases to rise, and the fluid thickens on cooling; carefully guarding it from taking fire. If the oil employed be at all acid or rancid, talc, powdered, or a small portion of chalk or magnesia, may be usefully added, and will assist the rising of the scum and the clearing of the oil, by its subsidence; and if it be kept at rest in a warm place, it will clear itself: or it may be strained through cloth and diluted with turpentine for use. *Gold size* for gilding is commonly made of boiled oil and fine Oxford ochre.

POPPY OIL

Is much celebrated in some old books under the appellations of *oil of pinks* and *oil of carnations*, as erroneously

translated from the French *œillet*, or *olivet*, a local name for the poppy in districts where its oil is employed as a substitute for that of the *olive*. It is, however, inferior in strength, tenacity, and drying to linseed oil, although next to it in these respects; and though it is of a paler colour, and slower in changing, it becomes ultimately not so yellow, but nearly as brown and dusky, as linseed oil, and, therefore, is not to be preferred to it. Boiled as above, it is the *Oglio Cotto*, or the *baked oil*, of the Italians.

NUT OILS

Resemble poppy oil in painting, but with inferior powers; and the *fish oils* of the *seal* and *cod*, though sometimes used with dryers in the coarser painting, are inferior in qualities to them all, and little better than *tar* similarly employed.

MEGILP,

Or *English varnish*, &c. Half a century ago, the jellied vehicles which received the cant appellations of *magilp* and *gumtion* were the favourite nostrums of the initiated painter, and have maintained a preference with many artists to this day. These compounds of one part or more of strong mastic varnish with two of linseed or other oils rendered drying as above and coagulable by the salts and oxides of lead, were, according to the preceding intentions, improvements upon the simple oil vehicle used on impenetrable grounds, by diluting it, and giving it a gelatinous texture, which enables it, while flowing freely from the pencil, to keep its place in painting, glazing, graining, &c.

GUMTION,

Composed of not more than an eighth of the acetate or sugar of lead, with simple oil and strong varnish, which

is subject to less change ultimately, particularly when the varnish abounds in the compound. In the using of sugar of lead, if the acid abound, which it does usually in the purer and more crystalline kinds, its power of drying is weakened, and it may have some injurious action upon colours, such as those of ultramarine and lakes. In this case a small addition of some of the pure oxides of lead, such as litharge, ground fine, will increase the drying property of the sugar of lead, and correct its injurious tendency. A similar composition of ground litharge rubbed with twice its quantity of nut or linseed oil, and a sixth of bees'-wax and used with mastic varnish, is called *Italian varnish.*

COPAIBA

Is a natural balsam of West Indian production in a liquid state, in which it may be employed both as a vehicle and a varnish: it being of tolerable strength in either use, and preserving its naturally pale colour, but it is entirely needless in common painting.

VOLATILE OILS,

Procured by distillation from *turpentine* and other vegetable substances, are almost destitute of the strength of the expressed oils, having hardly more cementing power in painting than water alone, and are principally useful as solvents, and media of resinous and other substances introduced into vehicles and varnishes. In drying they partly evaporate, and partly by combination with oxygen form resins and become fixed. They are not, however, liable to change colour like expressed oils of a drying nature, and, owing to their extreme fluidness, are useful diluents of the latter; they have also a bleaching quality, whereby they in some degree correct the tendency of drying and expressed oils to

discolourment. Of essential oils, the most volatile, and nearest in this respect to alcohol, is the oil of *sassafras;* but that most used in painting is the

OIL OF TURPENTINE.

The rectified oil, improperly called *spirit of turpentine,* &c., is preferable only on account of its being thinner and more free from resin. By the action of oxygen upon it, water is either generated or set free, and the oil becomes thickened, but is again rendered liquid by a boiling heat upon water, in which the oxygen and resin are separated from it. When coloured by heat or otherwise, oil of turpentine may be bleached by agitating some lime powder in it, which will carry down the colour. The great use of this oil, under the cant name of *turps,* is to thin oil paints, and in the larger use thereof to *flatten* white and other colours, and to remove superfluous colour in *graining.* It however weakens paint in proportion as it prevents its bearing out, and when used entirely alone it will not fix the paint.

OIL OF LAVENDER

Is of two kinds, the fine-scented English oil, and the cheaper foreign oil, called *oil of spike:* these are rather more volatile and more powerful solvents than the oil of turpentine, which render them preferable in enamel painting, of which they are the proper vehicles; they have otherwise no advantage over the latter oil, unless they be fancied for their perfume. The other essential oils, such as oil of rosemary, thyme, &c., are very numerous; but it has not appeared that they possess any property that gives them superiority in painting over that of turpentine: some of them have, however, more power in dissolving resins in the making of

varnishes, as is the case also with naphtha or petroleum and the rectified oil of coal tar.

NAPHTHA

And the *Coal Oil* of our gas works are even more powerful solvents than the vegetable essential oils; but on this account, and the usual bad scent of the latter, they are less eligible for the painter's use as vehicles: the rectified coal oil may, however, be deprived of its nauseous smell by agitating it during several days with dilute sulphuric acid, and subsequently washing the oil with a little powder or milk of lime.

SPIRIT OF WINE,

Or *Alcohol,* is weaker and more dilute than essential oils, or even than water, and is so volatile as to be of use in vehicles only as a medium for combining oils with resins, &c.—as a powerful solvent in the formation of spirit varnishes, and in some degree as an innocent promoter of drying oils and colours. It affords also powerful means of removing varnishes, &c.

CHAPTER XXV.

ON VARNISHES, ETC.

THE last operation of painting is *varnishing,* which completes the intention of the vehicle, by causing the design and colouring to bear out with their fullest freshness, force, and keeping; supplies, as it were, natural moisture, and a transparent atmosphere to the whole, while it forms a glazing which secures the work from injury

and decay. It is especially necessary for graining, and often in ornamental and fancy works of the art.

Varnishes are prepared from an immense variety of substances, of which the *resins*, improperly called gums, afford the best, and those principally used, and a vast number of preparations thereof uselessly compounded of many ingredients and little to be depended on, are recorded in different works, wherein as usual the simplest are the best. Varnishes are best classed according to their solvents, as water varnishes, spirit varnishes, essential oil varnishes, and oil varnishes, but more usually distinguished according to the substances from which they are prepared.

RESINOUS VARNISHES

Are either *spirit varnishes, volatile oil varnishes, fixed oil varnishes, natural balsams,* or compounds of these; their usual solvents being either spirit of wine or alcohol, oil of turpentine, or linseed oil.

The principal varnishes hitherto introduced and to be preferred in painting are the following :—

MASTIC VARNISH.

It is true that other soft resins are sometimes substituted for that of mastic, and that very elaborate compounds of them have been recommended and celebrated, but none that possess any evident advantage over the simple solution of mastic in rectified oil of turpentine. Some have used a varnish of *Damas,* or *common white resin* mixed with *naphtha.* Others have employed *mastic* and *sandarach* dissolved in *nut, poppy,* or *linseed oils,* and this is evident from the difficulty of removing varnishes from very old pictures. Mastic varnish is easily prepared, by digesting in a bottle during a few hours, in a warm place, one part of the dry picked resin

with three or four of the oil of turpentine. A quantity of this cleared varnish sufficient to gelatinize or set up either of the before-mentioned drying oils of linseed, constitutes the transparent *megilp* of the painter, &c. If, instead of drying oil, the simple pure linseed oil be used with about an eighth of acetate of sugar of lead dissolved in water, or ground fine, we obtain variously the opaque mixture called *gumtion*.

COPAL VARNISH.

As other soft resins are sometimes substituted for mastic, so inferior hard resins are sometimes employed in the place of copal in the composition of varnishes celebrated as copal varnishes. Copal is of difficult solution in turpentine and linseed oils, both of which enter into the composition of the ordinary copal varnishes, which are employed by the coach painter and herald painter, and afford the best varnishes used by the house painter and grainer. Combined, however, with linseed oil and oil of turpentine, copal varnish affords a vehicle superior in texture, strength, and durability to mastic and its megilp, though in its application it is a less attractive instrument, and of more difficult management. As copal swells while dissolving, so its solutions and varnish contract, and consequently crack in drying, and thence linseed oil is essential to prevent its cracking. The mixture of copal varnish and linseed oil is best effected by the medium of oil of turpentine, and for this purpose heat is sometimes requisite: strong copal varnish and oil of turpentine in equal portions with one-sixth of drying oil mixed together, hot, afford a good painter's vehicle: and if about an eighth of pure bees'-wax be melted into it, it will enable the vehicle to keep its place in the manner of magilp. Elemi, anime, and resins of inferior

hardness are sometimes substituted for copal in preparing its varnish.

WHITE LAC VARNISH

Is a new varnish introduced by the author. It is prepared by dissolving in alcohol or spirit of wine the lac resin of India, deprived chemically of all colouring matter, and purified from gluten, wax, and other extraneous substances with which it is naturally combined; without which process the varnish it affords is opaque and of the dark colours of the japans and lackers of the East, but when thus purified, its varnish is brilliant, transparent, very hard, and nearly colourless. This varnish, being a spirit varnish, requires a warm temperature, which is useful in all varnishing, and it dries rapidly. Its place is usually supplied by the *light, hard varnish* of the shops, in which softer resins are used with shell-lac.

LAC

Is of three principal kinds, namely, *Stick-lac*, *Seed-lac*, and *Shell-lac*, of dark or light amber colours, of which the last is the purest, and that of palest colour is the best for varnishes. They are all soluble in pure spirit of wine. Various compositions of *Lac* with less than a fourth of mastic or sandarach, all dissolved, without fire, in spirit of wine, afford the *French polishes*, which are applied to cabinet work by a roll of woollen list or cloth wound tight, the face of which being dipped into the varnish and covered with a fine linen rag, having a drop only of linseed oil on the centre, is used circularly as a rubber for the varnishing and polishing the plain surfaces of the work by an easy and efficacious process, the carvings and mouldings which the rubber cannot reach requiring to be varnished with the brush. The dipping of the rubber, and supplying the

drop of oil, are to be repeated alternately as the work goes on, till the whole is completed.

COWDIE,

Or *Fossil Varnish.* A new resin which exudes naturally from the *Cowdie Pine* of New Zealand and Australia into the soil at the foot of the trees, from which being dug, it has obtained the improper name of *Fossil Gum*, under which it has been imported, and being a fine, transparent *resin* nearly of the hardness of copal, and of similar habits, may become a valuable substitute for the hard varnishes in decorative painting and fine art. But it has hitherto been rejected by manufacturers of varnishes, first from the want of success in forming a permanent solution, owing to its precipitating from the solvents after being dissolved, and secondly from the danger of ebullition, inflammation, and explosion of gas evolved during its solution.

This latter defect arises from the water absorbed by the resin in its growth, or in the earth, which renders it opaque, but from which it may be freed by grossly powdering and drying, when the resin becomes transparent as glass, and may be melted and dissolved with the safety of other resins; and the first-named difficulty we have effectually remedied by the following simple formula, which yields a strong varnish that dries readily and with a fine surface :—

Take of broken and dried *Cowdie Resin* one part, melt it in the ordinary vessel, with the usual caution, and stir well and gradually into it, over a fire sufficient to boil without burning it, four parts or more of hot oil of turpentine till the solution is completed, finally stir it well and keep it hot off the fire one hour to clear. In this way, strictly followed, the cowdie or fossil resin will afford an excellent varnish applicable to the pur-

poses of the usual copal varnishes, and superior to that of mastic varnish for pictures in not cracking like copal, and being more permanent than mastic, and as easily and safely removed when requisite: but it does not magilp with drying oil, although it may be mixed and employed therewith.

We are are of opinion also that, from the abundance, cheapness, and excellence of this resin, it is especially applicable to the purposes of civil, military, and naval architecture, in whatever works a varnish may be required or can be usefully employed, to which the difficulty and danger of permanent solution have been hitherto the obstacles with manufacturers of varnishes accustomed to the old *resins* of elimi, copal, sandarach, &c., improperly called *gums;* but which objections are entirely remedied by the preceding formula. It is, we presume, for the uses here suggested that the American merchants have become great purchasers of the cowdie resin.

GENERAL REMARKS.

Upon comparing the qualities of the varnishes of mastic, cowdie, copal, and lac, it will appear that the latter are successively harder and more perfect as varnishes, and in proportion to their perfection as *varnishes* is the difficulty of using them as *vehicles;* and as it is necessary that before varnishing with any of them the picture should be thoroughly dry, to prevent subsequent cracking, this is perhaps more essential for the latter than for the former. Notwithstanding this necessity, there is one highly important advantage which seems to attend early varnishing; namely, that of preserving the colour of the vehicle used from changing, which it is observed to do when a permanent varnish is passed over colours and tints newly laid; but this it

does always at the hazard, and often at the expense, of cracking, and early varnishing with soft varnish dries slowly and is more disposed to bloom.

This saving grace of early varnishing appears to arise from the circumstance that, while linseed and other oils are in progress of drying, they attract oxygen, by the power of which they entirely lose their colour; but, after becoming dry, they progressively acquire colour. It is at the mediate period between oils thus losing and acquiring colour, which commences previously to the oil becoming perfectly dry, that varnish preserves the colour of the vehicle, probably by preventing its further drying and oxidation, which latter may in the end amount to that degree which constitutes combustion and produces colour:—indeed it is an established fact that oils attract oxygen so powerfully, as in many cases to have produced spontaneous combustions and destructive fires.

It is eminently conducive to good varnishing, in all cases, that it should be performed in fair weather, whatever varnish may be employed; and that a current of cold or damp air, which chills and blooms them, should be avoided. To escape the perplexities of varnishing, some have rejected it altogether, contenting themselves with oiling-out,—a practice which, by avoiding one extreme, runs to its opposite, and subjects the work to ultimate irrecoverable dulness and obscurity.

The manufacturing processes for the varnishes now generally used have been detailed in the *Transactions of the Society of Arts, &c.*, vol. xlix. But with regard to the recipes for compounding varnishes, &c., superabounding in ancient and modern treatises, however flatteringly recommended, there are few eligible and yet fewer justifiable to art and good chemistry by

the simplicity upon which certainty of effect depends, being in general quite of the class of the recipes and formulæ of the old cookery-books and dispensatories.

Presuming the decorator and painter to have acquainted himself with the principles of colours, &c., so as to apply them with taste and effect, as well as with a due knowledge of his materials, both of which are indispensable, there will yet remain to the complete mastery of his art the various modes and operations of painting, &c., in which they are to be applied, but for which he must rely upon his acquirement of skill and practice. These, therefore, we now proceed finally to describe, with such observations and additions as may appear expedient.

PART IV.

THE MODES AND OPERATIONS OF PAINTING.

CHAPTER XXVI.

OF MATERIALS, AND THE METHOD OF USING THEM.

We must assume that our student has mastered the elementary principles, and has attained some power in the practice of drawing;* we shall therefore proceed with instructions as to working with the brush, as distinct from that done with the pencil. This latter term has been applied to small brushes, such as "camel-hair" and "sable" pencils, and is generally used symbolically in relation to painting: thus Sir Joshua Reynolds says, "the pencil speaks the tongue of every land."

Still, in general terms, a brush is understood to mean the implement with which wet colour is applied, in opposition to the dry point, such as a crayon or lead pencil.

The simplest method of painting is that in which water alone is used as a medium; and we therefore

* For a course of elementary drawing, adapted for painters, grainers, and letter-writers, see the "Practical Manual for House-Painters, &c.," of this series.

make this a starting-point, the pigments having been previously mixed with a mucilage.

The paper on which water-colour painting is executed is of various degrees of roughness; for it will of course be understood that it is necessary that there should be some "tooth" or grain on the surface; the very smooth being only adapted for a very minute drawing which is to be very highly finished. The following are the sizes of the different drawing-papers, and these may be obtained either hot-pressed, plain, or, as it is called, "not," meaning not hot-pressed, or possessing a finely grained surface for water-colour painting generally, and rough (in various degrees) for large and bold pictures.

The following are the names of the various drawing-papers and their sizes:—

Demy	20	inches by	15
Medium	22	,,	17
Royal	24	,,	19
Super Royal	27	,,	19
Imperial	30	,,	21
Elephant	28	,,	23
Columbier	34	,,	23
Atlas	33	,,	26
Double Elephant	40	,,	26
Antiquarian	52	,,	31

Several of these papers may be had of an extra thick quality.

The paper most generally used is the Imperial, either full size or in halves, 21 × 15, or in quarters, 15 × 11½.

The student will no doubt be possessed of a drawing-board; if not, he is advised to purchase one at a respectable shop, rather than to have one made, as, in the former case, he can select from a stock of boards which have been kept some time, and are therefore likely to be well seasoned, whilst, in the latter, he will run the risk of the newly made board warping

twisting, or cracking. Drawing-boards are made in various ways.—1. Clamped: in these, pieces are placed across the ends, and are attached by what is called the plough-and-tongue joint; this is a very generally adopted method, and is only open to the objection that, as the fibres of the end-pieces are in an opposite direction to those of the board itself, the latter is liable to shrink in one way, and the former in another, thus, after a while, the ends of the cross-pieces will be found to project beyond the edges of the board. This will not, however, last long, and when it has been once or twice corrected by the plane being run along the edge, it will cause no further inconvenience. 2. The cross-piece may be put on by the method called mitre-clamping, in which it is cut slantingly at its ends, the board being correspondingly cut to receive it. This is not as a rule advantageous, as, should any shrinking take place, the cross-pieces would be forced out of their mitres, and the board thus thrown out of square. 3. A very good board is made by placing rabbets across the back of the board; these should be fixed edgewise, and should be inserted into grooves, the sides of which are cut so as to slant inward, the rabbets being planed to fit; the grooves and the rabbets should be rather wider at one end than at the other, and they may thus be tightened by a blow from a hammer. They should not be glued, but should be merely attached by one screw near the end of each. Thus, whilst the board is prevented warping or twisting, it is allowed to expand or contract, and splitting or cracking is prevented. We are thus particular in relation to boards in order to avoid the annoyance ensuing from twisting and warping during the progress of a picture, of which there is the more likelihood from the frequent washes applied to the drawing, the

board being thus subjected to constant alternations of wet and dry.

The paper for water-colour painting should be attached to the board by the method called "stretching." This is done in the following manner. The paper is cut so as to be slightly smaller than the board, a strip of about three-quarters of an inch being removed all round; a border of about half an inch is then to be turned up on each side. The sheet is next to be turned face downward, whilst the back is to be covered with water, which must be allowed to soak well in. The moisture should be equalised by means of a sponge, so that one part may not be more wetted than the other.

The paper is then to be turned—the wetted side towards the board—and paste is to be applied to the upturned edges, which are subsequently to be pressed down, during which operation the paper is to be stretched, the thumbs being placed against the edge of the board and the fingers on the edge of the paper whilst drawing it outward.

If whilst drying some of the blisters which naturally arise in the damp paper do not seem to decrease with sufficient rapidity they should be pricked with a needle in several places, so as to allow the air to escape; this will in most cases be found a sufficient remedy, but if not successful the surface of the paper must be again moistened all over, especially towards the edges; and if this should fail also, the paper must be taken off the board and the operation repeated altogether. The edges should be well rubbed down with the handle of a penknife or some similar article, and the paper should be placed to dry in a horizontal position.

Sketching-blocks are very convenient, as they serve the purpose of a drawing-board with a quantity of paper ready stretched upon it. They consist of a

number of pieces of paper well pressed and fastened together at their edges, so as to form a compact mass or block, which is then glued down to a piece of very thick millboard. As each drawing is finished it may be removed by inserting the penknife into a small aperture specially left open and running it round the edges, by which means the sheet will become detached and another ready for the next work will be presented.

The outline having been made, the colouring is to be proceeded with, but at this stage it is necessary to warn the student that no amount of colour will ever convert a bad drawing into a good painting, and that the further the work progresses the more will the effect of incorrect outline become visible, and the more difficult will alteration become; the sketch should, therefore, be most carefully corrected before the process of painting is commenced.

Moist colours are taken from the pans on the point of the wet brush, and either transferred directly to the paper, or placed on the slab or palette, so that a quantity may be mixed with water. This is by far the safer plan, where any portion of the drawing is to be evenly covered. The moist colours in tubes are used by pressing on the lower end of the tube, when the colour, which is of some consistency, will be forced from the aperture opened by unscrewing the lid. The little pyramid of colour thus deposited, is then to be mixed with water, by means of a palette-knife, or it may be washed down by a brush. Colour of any degree of depth may thus be obtained.

Water-colours in cakes are the most old-fashioned form, but still retain their hold in the estimation of perhaps the greater number of artists, as they are for many reasons the most convenient, although for large work the pans and tubes are better, as colour may be

mixed in quantities from them with greater rapidity than from the cakes. In rubbing the colour, the cake should not be dipped into the water-glass, as in that way its edges become wetted more than necessary, and cause it to crack and chip. The water should be placed on the slab by means of a brush, and the colour rubbed in it, the cake being afterwards placed on one of the edges at right angles to that which has been rubbed until it has dried, when it is to be restored to its place in the box.

When it is required to compound a tint from two colours, each of them should be rubbed separately on the slab, a space being left between them on which they should be mixed with a brush; by this means the cakes are kept unsoiled by other tints.

When a quantity of colour is required in order to cover any large surface, it should be mixed in a saucer, and having been allowed to stand for an hour or so, the colour should be carefully poured off into another vessel, leaving any sediment or particles of colour which may have broken off in the original saucer, and the rest of the colour will be smooth and clear.

This cannot, however, be done with all colours; for some of them, such as vermilion, emerald green, &c., are so heavy, that nearly the whole of the colouring matter sinks to the bottom, and the liquid poured off would be almost pure water. It is, therefore, necessary to stir such at every brushful taken; but they are not adapted for flat washes.

In order that the colour may flow easily, it should, for washing, be thin; and it must be pointed out that the safest plan which can be adopted by the student is to work in stages, keeping the picture rather too light than the opposite until it is near completion, when the finishing and spirited touches can be put in; for it is

easy by repetition to darken the work, but always difficult and troublesome to lighten it if too dark.

When the colour has been laid on, it should not be touched until it has dried; should any spots then appear darker than others, they may be lightened by rubbing them with a moist brush, a piece of Indian-rubber, or bread crumbs; and any part which may be lighter than the rest may be covered with another wash, or may be as it were darned, by stippling, that is, by small dots, or separate touches, done with a brush containing only a very small quantity of colour.

The student is urged never to employ a small brush where a large one could be used. Small brushes make the work look streaky, and boldness of manipulation, so much to be desired, is only to be attained by the use of large ones. In using large brushes, however, great care is necessary in order to preserve the outline; but very fine points can be made to good brushes by drawing them along a piece of waste paper, and, when held upright, very small work can, when required, be done with them.

In laying a flat wash, care should be taken that sufficient colour is prepared for the immediate purpose, as the necessary evenness of the tint will be injured if the progress of the work be interrupted. The brush should contain as much colour as it will hold without allowing it to run down, but the point should be preserved. The work should be commenced at the top, the board being placed in a slightly inclined position.

Before commencing to work in colours, it is advisable that the student should have some practice in what is called painting in monochrome, or one colour; and for this purpose sepia is generally preferred, from the ease with which it washes.

It is a good plan to draw several squares, triangles,

and oblongs, of different sizes, and to commence by laying a flat wash over each of the smaller figures, and advancing to the larger ones, for increased practice; for it will at once be understood that the difficulty of laying a flat wash increases with the size of the surface.

When a certain amount of power in using the brush has thus been attained, figures having a greater number of angles, such as octagons, nonagons, &c., should be drawn and coloured, care being taken not to pass over the outline, but still to carry the colour into all the angles, whilst spreading it evenly over the surface. In doing this, the brush should be held as nearly upright as possible.

The tints should next be graduated, commencing pale at the top, and becoming darker towards the bottom. This is accomplished in the following manner. Mix the colour in three degrees of depth, in as many different compartments of the slab. Commence with the lightest, and when the work has proceeded about one-third of the width of the surface to be covered, remove as much as possible of the colour from the brush, either against the edge of one of the compartments of the slab or on a piece of waste paper, and with the brush in this condition carry on the work a little further, so that there may not be a quantity of colour at the edge of the strip which has been tinted. Next, take a little of the colour of the second degree of strength, and with it pass over the edge of the strip just coloured whilst the latter is still wet; the two tints will thus be easily blended, and the full brush will then be used to carry the work further; in the same way the gradation from the second to the darkest tint is to be made.

The next study should be derived from a cylindrical surface, such as a garden-roller, a barrel, a jug, &c. In

subjects such as these the tone becomes gradually darker as it removes from the highest light; but the darkest portion is relieved near the edge by a reflected light. The student is urged to make several studies from objects, from which he will, by careful observation, learn much more than he could from an infinite number of drawing-copies.

The next subjects for practice should be of the spherical character, commencing with objects such as a cup or basin, which are only partially globular, and subsequently proceeding to complete spheres, such as a large ball, an orange, fruit, &c.; in fact, a group consisting of three apples, placed next to each other, with a fourth resting on them, forms an excellent study of form, and of light and shade, whilst a bunch of grapes, as was long ago asserted by Titian, is the best that could be conceived.

A certain amount of practice in the use of the brush having been thus obtained, and the student having acquired a mastery over the implement and the colour he employs, the same method of proceeding is to be applied to the colours generally.

As our instructions are intended to lead more to decorative than landscape painting, we refrain from referring to the methods of obtaining the numerous and ever-varying effects visible in nature, but we still urge that observation of these must tend to improve the eye for colour, and to elevate the taste.

The decorative artist is advised to practise flower-painting in water-colour, since flowers, rendered naturally and conventionally, form such an important element in ornamental art. But we must again urge correctness in drawing, and careful study of the natural growth and botanical features of the plant, so that it may, in being adapted to an ornamental

purpose, retain its natural characteristics. It is this knowledge which enables the designer to conventionalise with such admirable effect, as we see in some of the better class of decorations; it is this knowledge by which a man rises from a mere drudge to the position of an artist; and it is by these means that he acquires the power of pleasing the eye and refining the taste of those around him.

Having for a short time painted flowers from copies, the student is advised, as soon as possible, to take nature as his model, and to paint first from a single flower or spray, and subsequently from groups.

The first tints are to be laid on as washes, the petals and leaves being subsequently worked up by stippling; but this must not by any means be overdone, but should be resorted to merely as a finishing process—to give, however inadequately, an idea of the exquisite refinement of the subject itself.

The decorative artist should also make the human figure an integral portion of his study; nor should animal forms be neglected, entering as they do into so many branches of ornamentation.

CHAPTER XXVII.

PAINTING IN TEMPERA.

This mode of painting, which is undoubtedly the most ancient, and which, in trade purposes, is called Distemper painting, derives its name from the fact that the colours are "tempered," or mixed with some liquid or medium to bind their separate particles to each other and to the surface to which the paint is to be applied.

The following is quoted from "Painting popularly Explained" (*Gullick and Timbs*):—"The Italian noun *tempera* admits of the widest application, and would include any medium, even oil; but, in its restricted and proper acceptation, it means a vehicle in which the yolk of egg, beaten sometimes with the white, is the chief ingredient, diluted as required with the milky juice expressed from the shoots of the fig-tree. This is the painting strictly termed *à novo* by the Italians. Vinegar, probably, replaced the fig-tree juice among the northern artists, from the difficulty of obtaining the latter, and in modern use vinegar is substituted.

"Haydon says vinegar should be used to prevent the putrefaction of the yolk of egg; but the early Italian painters preferred the egg-vehicle when it had been suffered to stand until it had become decomposed: hence the phrase *à putrido.*

"The artist is often compelled to have recourse to very offensive media to make known his most refined revelations. On walls, and for coarser work, such as painting on linen, warm size was occasionally used, but the egg-vehicle, undiluted, was generally preferred for altar-pieces on wood. For various purposes, and at different periods, however, milk, beer, wine, and media composed of water and more or less glutinous ingredients, soluble at first in water, such as gums, &c., have also been used. Such are the media or vehicles described by the chief Italian writers as used in the days of Cimabue, Giotto, and Fra Angelico, and by the early painters before the invention and improvement of oil painting. Pliny also mentions milk and the egg-vehicle as employed for ancient wall-paintings. The finer egg *tempera,* in dry climates, has been found to attain so firm a consistence as to withstand ordinary solvents. The use of wine in diluting these glutinous vehicles was

common for a long period. Buffalmacco, of whom so many humorous stories are told by Boccaccio and Vasari, is related to have persuaded some nuns, for whom he painted, to supply him with their choicest wines, ostensibly for the purpose of diluting the colours, but really to be imbibed by the thirsty painter himself. The northern artists were sometimes obliged to content themselves with beer. In the works of the northern *tempera* painters there are, however, very marked differences observable in their *impasti*, or body colour. It is certain, therefore, that these painters employed media of different degrees of consistency. In the distemper of scene-painting the medium is weak size of glue (glue dissolved), but plaster of Paris, sufficiently diluted, is worked with the colours. The carbonate of lime, or whitening, is less active as a basis for colours than the pure lime of fresco, but it is entirely destructive of transparency. When the more viscid media were employed by the *tempera* painters the effect must, with their purer use of the colours—some of which, moreover, were transparent—have been very lustrous and powerful in comparison with modern scene-painters' "distemper;" and these qualities were heightened by the addition of a strong varnish. Still, however, *tempera* fell far short of oil painting in richness and transparency."

The carbonate of lime, or whitening, employed as a basis, is, however, less active than the pure lime of fresco. The vehicles of both modes are the same, and their practice is often combined in the same work: water is their common vehicle; and to give adhesion to the tints and colours in distemper painting, and make them keep their place, they are variously mixed with the size of glue (prepared commonly by dissolving about four ounces of glue in a gallon of water). Too

much of the glue disposes the painting to crack and peel from the ground; while, with too little, it is friable and deficient of strength. In some cases the glue may be abated, or altogether dispensed with, by employing plaster of Paris sufficiently diluted and worked into the colours; by which they will acquire the consistency and appearance of oil paints, without destroying their limpidness, or allowing the colours to separate, while they will acquire a good surface, and keep their place in the dry with the strength of fresco and without being liable to mildew—to which animal glue is disposed, and to which milk, and other vehicles recommended in this mode, are also subject.

Of more difficult introduction in these modes of painting is *bees'-wax*, although it has been employed successfully in each of them, and in the encaustic of the ancients, who finished their work therein by heating the surface of the painting till the wax melted.

Tempera may be considered as opaque water-colour painting, since water enters more or less into the composition of all the media employed. The fact, however, that the colours thus mixed (with body white) are opaque constitutes the great difference; and thus whilst, as a rule, the lights in water-colour painting are obtained by leaving the white paper more or less exposed, and by washing transparent colours over it, allowing for the effect resulting from the colour being rendered lighter by the white ground underneath, all these gradations are accomplished in *tempera* by means of colours with which white is mixed in various quantities, the high lights being executed in pure white. In all these respects *tempera* agrees with oil painting, the respective vehicles alone constituting the great distinction.

This style is very important to the decorative painter, and the student is, therefore, advised to practise it. It

must be borne in mind that the same facility in blending the colours does not exist in *tempera* as in water-colour painting, for if the colour were diluted with water, in order to soften it off, the gelatinous quality of the medium would be exhausted, and the colour would rub off; it is, of course, impossible to prepare as many gradations as there are tints in nature, and such as are placed next to each other dry by far too quickly to allow of their being blended together. The processes of "hatching" and "stippling" have, therefore, been employed. "Hatching" is another word for "etching," and consists in working lines in different directions so as to give the appearance of relief required. Stippling is done in dots instead of lines. The methods are often seen combined, the dots being placed in the lozenge-like spaces left by the crossings of the lines.

The method principally used in decorative painting is that by which the effect is obtained by flat tints of different gradations; and practice will soon enable the artist to blend these very successfully in the ornamental forms of which the design consists.

A beautiful set of flowers in flat tints, as studies for *tempera* painting, is published under the auspices of the Department of Science and Art, and may be obtained through Messrs. Chapman and Hall, Piccadilly.

CHAPTER XXVIII.

PAINTING IN OIL.

THE various oils, megilps, varnishes, &c., used in painting in oils have already been described. It is not, however, necessary that the student should prepare

these for himself, as they may all be purchased at most reasonable prices. The information in the body of the book is, however, given in order that the student may be acquainted with the composition of the different vehicles, and be able to manufacture them should circumstances at any time require him to do so.

The colours used in oil painting have been given in Table XIII. The method now adopted of supplying them in collapsible tubes is a great improvement on those of former years. In early days the artist had to grind up his own colours in oil by means of a muller, or piece of stone, on a marble slab; perhaps he had to roast the raw sienna and umber to produce the burnt sienna and burnt umber, and to pound them in a mortar; the paints were then kept in jars, or gallipots, from which they were taken with the palette-knife. At a more modern period the colours, ready ground up in oils, were tied up in pieces of bladder, like so many small puddings, a label outside denoting the contained colour. These were then termed "bladder colours," as we now speak of "tube colours." When the bladders were to be used a hole was pricked, the bladder was squeezed, the contents curled out like a handsomely coloured worm; a tack or small nail was then placed in the aperture to close it up.

The brushes used in oil painting are principally those made of hog-hair, sable, and badger—fitch and goats'-hair brushes are also employed. These brushes are made round and flat, and are mounted in tin. Flat hog-hair tools are generally preferred to round ones, as they give that squareness in the outline which contributes so much to the boldness and crispness in the work.

It is almost needless to explain that the brushes should not be cut at the ends, but that the natural

point of each hair should be carefully preserved. If any special form of brush is required, in order to accomplish certain results, they may be purchased under the head of irregular-shaped tools, amongst which are the Short Hair Flat, the Long Hair Flat, the Landseer brush—especially adapted for animal painting, made of extra thin hair; the Short Hair Round; Extra Long Hair Round; the Set Brush, in which the hair is gathered into several separate tufts, with spaces between them; the Swallow-tail or Double-pointed brush; the Straight Angular Edge, in which the hair of the brush, which is a flat one, slants to a point in the middle; the Angular Brush, in which the hair slants from one side of the point to the other; the Hollow Brush, &c.

All these are, however, intended for special methods of manipulation; the student is advised to work with the usual forms, only availing himself of the above when he has obtained full mastery over the other, when he wishes to accomplish a particular effect. In decorative painting, however, this contingency is scarcely likely to occur.

The *hog-hair brushes*, although firm, should be soft and elastic, returning to their straight shape immediately after being pressed against the hand. It is a good plan to soak new brushes for an hour or two in water, thus causing the hair to swell. The ends subsequently dry, and as they are then immersed in oil-colour, the portion enclosed by the tin still retains, for some time, a certain amount of moisture; and as this dries away its place is taken by particles of paint—thus preventing, in a great degree, the annoyance caused by loose hairs working out during painting.

Sable brushes.—The hair of these is, of course, softer than the hog, and thus they may be brought to a finer

point, which is still very firm. Although they go by the name of "Red Sable," the best hair is of a pale yellowish cast. The round sables are very useful in working up and finishing details. Some are set in quills and go by the name of "sable pencils;" those which bag near their insertion should be avoided.

Badger tools are differently formed from the others; they are so bound that the hairs, instead of combining to form a point, spread outward—something after the fashion of a shaving-brush. This brush enjoys the pleasant name of "softener" or "sweetener," and is used to blend the freshly laid colours together by sweeping over them.

We cannot too strongly warn the student against the too frequent use of the softener, as it is apt to produce a woolly, feeble, and (if we may use the term) unbusiness-like appearance. A little practice will enable him to blend his colours with the brushes he is using, or at most a larger tool, and he will soon learn to use the softener as a duster only. When the badger tool has been much used a certain amount of colour will adhere to the ends of the hairs, and thus will inflict a series of scratches over the colour it is intended to soften; it is therefore necessary that it should be frequently cleaned. This is done by gathering up the hairs and holding them tightly whilst rubbing them on a dry rag each time the brush has been used; and it should also be occasionally washed with soap and water and well rinsed. The water which remains after the hair has been squeezed may be got rid of by striking the brush against the edge of the easel, or against the maul-stick, and it may then be placed to dry.

All the brushes used in oil painting should be carefully cleansed; the hair should be dipped in raw lin-

seed oil, which should be rubbed in by pressing the brush between the fingers, so that all the colour it contains may be diluted and set free from the hairs. This liquid colour should then be pinched out by drawing the brush between the finger and thumb, and it should afterwards be thoroughly washed with soap and warm water until the frothy matter formed by rubbing the brush in the hand is perfectly colourless. The brushes should then be rinsed in clean water, which should be beaten out of them in the manner already described. It is not a good plan to wipe them on a cloth, as the smallest possible piece of fibre adhering to the ends of the hair may prove a very great annoyance; the only rag which may be used for this purpose with perfect safety is an old disused silk handkerchief. Some artists use turpentine instead of linseed-oil; but turpentine is injurious to the brushes, as it renders the hair harsh and stiff; it should only be used when it is required to wash out a brush quickly during work, so that the hairs may not be soaked in it. Some painters use a mixture of nut-oil and turpentine in the first instance, and pure nut-oil afterwards, which latter they do not quite wipe out, and thus the brush is kept soft and moist for use—the nut-oil being a very slow drier. When the brushes are to be used in the same colours the next day, they need not be cleaned at night, but may be dipped in nut-oil and laid in a tin slant until wanted again. "Brush washers" are small tin cans, in which a still smaller one, the bottom of which is pierced with holes, is placed—in the same way that a glue-pot is placed in the outer pan. This inner vessel does not reach to the bottom of the outer receptacle, and has a piece of wire placed across the top; the liquid in which the brush is to be cleaned is poured in until it rises about half way in the inner vessel;

the brush is then washed in it and rubbed off against the wire; the liquid, containing the colour in suspension, drains through the pierced bottom of the vessel, and sinks by its own weight to the bottom of the outer can, whilst the liquid rises, pure and limpid, in the inner one.

The surface most generally used for painting upon is canvas. It is sold in rolls of various widths and qualities—"plain cloth," "Roman," and "ticken." The most general form, however, in which it is purchased is stretched on frames, with wedges at the angles by which it may be tightened up. These are made in certain sizes, and in proportions adapted for portraits or landscapes. Thus we have, amongst the rest, the Kit-Cat size—named after the club—the portraits of the members of which were painted by Sir Godfrey Kneller in this size, in order to fit the room in which the pictures were to be placed—this measures 36×28 inches. The following are some of the sizes used :—

	Ft.	In.		Ft.	In.
Head size	2	0	by	1	
Whole length ..	[illegible]			4	10
Half length ..					4
Bishop's half length					
Bishop's whole length					

Many of the painters of old executed some of their finest works on panels of wood, and such, made of well-seasoned mahogany, are still often used: besides which we have prepared millboards, which afford an excellent surface for painting; the Academy boards, made of a thinner millboard and well adapted for sketching; and also prepared oil-paper, which is exceedingly useful, whilst it is very economical and portable. If it be desired to preserve the sketch, it may be glued on to a strained canvas. The method of painting in oil may be described as consisting of four processes—Dead Colouring, Glazing, Scumbling, and Impasting.

Dead colouring is the first, or preparatory, painting: it is so called because the colours are laid on in a dead or cold manner—to form, as it were the ground for the subsequent processes—resembling in some degree the work known amongst house-painters as "priming," the future effects being rather indicated and provided for than really attained. It is sometimes found convenient to divide the painting of a picture into certain stages, termed first, second, third, and fourth paintings, &c.

Glazing consists in spreading colour, much diluted, over the picture, or parts of it.

The, colours which when mixed with the proper vehicles become transparent, are called "glazing colours." The purpose of glazing is to deepen shadows and to give warmth or coldness to their hues, to subdue lights which may appear too strong, and to give force and richness to the picture.

"Glazing forms a distinct series of tints, without which it is impossible to represent transparent objects. By it, shadows are strengthened, and warmth or coldness given to their hue; by it, also, lights that are unduly obtrusive are subdued, or additional colour and tone given to those that are deficient in force and richness. The processes of glazing, we have observed, is generally effected by the application of diluted transparent colour; but occasionally semi-transparent colours are used when rendered sufficiently transparent, by the admixture of a large proportion of vehicle. Such glazings are useful to modify parts of the picture, or produce particular effects, such as representations of smoke, mist, dust, and the like. Glazing, when used injudiciously or in excess, produces that "horny" uniform dulness of surface and "leathery" discoloration so offensive to the eye, which, till recently, was

the common characteristic of the modern Continental Schools."*

Scumbling resembles glazing, but the colours used are opaque ones. It is used to give distance to objects which appear too near, and to modify effects which are found to be too strong. The colour thus used, after a time sinks partially into that over which it is passed, producing beautiful effects. Dry-touching, or dragging, consists in the addition of a few sharp or bold touches or lights: great care should be taken so that this process may not be overdone, so as to produce what is known as a "mealy" appearance.

Impasting (Ital. *impasto*) consists in painting the highest lights solidly with opaque colours—that is to say, mixed more or less with white, and laid on thickly —not only with the brush, but often with the palette-knife. Impasting gives texture and surface. In the foreground, and in parts not intended to retire, "impasto" should be bold; but this loading of masses of colour upon the picture, so as to give actual relief to the high lights, making them project considerably from the surface, has its disadvantages; for although the parts thus mechanically raised are strongly illuminated by the light impinging on their prominences, these protuberances of paint will, of course, in certain lights, cast a shadow of their own. They also afford lodgment for dust, and, owing to the quantity of white in them, they are very liable to discolour; and thus it often occurs that they form dark or dirty patches in the very places where high lights were intended.

The easel—a ladder-like frame on which the canvas is placed during painting, so made that the picture can be raised or lowered to suit the convenience of the artist—is an important item in the furniture of the

* "Painting Popularly Explained," Gullick and Timbs.

studio, and, besides the other implements mentioned—Palettes, are indispensable. These are made of mahogany, or of satin or other light woods—the latter are to be preferred for mixing tints, the precise tones of which can be better seen on them than on the darker ones. Palettes should be light in weight, and the oblong ones will be found more useful than those of the elliptical shape, as they afford more space for colours. New palettes should be prepared for use by rubbing raw linseed-oil repeatedly over them until they will absorb no more, the last coat being allowed to dry in; the palette will not then be stained by the absorption of colour.

The palette should be carefully cleaned every day on leaving off work, and colour should not by any means be allowed to harden upon it. When all the colour has been scraped off with the palette-knife (carefully observing not to make scratches or indentations), the surface should be cleaned with a piece of silk rag dipped in nut-oil, the edges being also well attended to. We have often observed students merely cleaning off the middle of the palette, whilst round the edges there have been accumulations of hardened colour. The palette should be left each night as clean as when first used. Should it be desired to save any colour which may remain, for next day's use, it should be scraped off the palette and placed in a little heap in a saucer, and covered with water, which, when poured off, will leave the colour fresh and good, or it should be put on a piece of tinfoil, which may be closely rolled up, thus forming a temporary collapsible tube.

CHAPTER XXIX.

THE art of painting in Fresco is naturally adapted to decorative painting, and the zealous attention of eminent artists of the day having been turned to the revival of this grand and important mode of art, a few remarks thereon are deemed desirable.

It is hardly necessary to inform the reader that *fresco painting* is performed with pigments prepared in water, and applied upon the surface of *fresh-laid plaster* of lime and sand, with which walls are covered; and as it is that mode of painting which is least removed in practice from modelling or sculpture, it might not improperly be called *plastic* painting; for which the best lime, perfectly burnt and kept long slacked in a wet state, is most essential. As lime in an active state is the common cementing material of the ground and colours employed in fresco, it is obvious that such colours or pigments only can be used therein, as remain unchanged by lime. This need not, however, be a universal rule for painting in fresco, since other cementing materials as strong or stronger than lime may be employed, which have not the action of lime upon colours—such is calcined gypsum, of which plaster of Paris is a species; which, being neutral sulphates of lime, exceedingly unchangeable, have little or no chemical action upon colours, and would admit even Prussian blue, vegetal lakes, and the most tender colours, to be employed thereon, so as greatly to extend the sphere of colouring in fresco, adapted to its various design; this basis merits also the attention of the painter in crayons, scagliola, and distemper.

So far, too, as regards durability and strength of the ground, the compo and cements now so generally employed in architectural modellings would afford new and advantageous grounds for painting in fresco; and as they resist damp and moisture, they would be well adapted, with colours properly chosen, to situations in which paintings executed in other modes of the art, or even in ordinary fresco, would not long endure.

As these materials, and others now in use, were either unknown or unemployed by the ancient painters in fresco, their practice was necessarily limited to the pigments enumerated in the preceding Table IX.; but every art demands such a variation in practice as adapts it to circumstances and the age in which it is exercised, without attention to which it may degenerate, or, at best, remain stationary, but cannot advance.

Although differing exceedingly in their mechanical execution, the modes of fresco, distemper, and scagliola agree in their chemical relations; so far, therefore, as respects colours and pigments, the foregoing remarks apply to these arts.

From the fact that fresco is executed on the plaster whilst in a wet condition, it becomes necessary that the portion of the work begun in the morning should be finished before evening. Full-sized drawings are therefore prepared, and the portion which is to be painted in the day is transferred to the plaster, of which just a sufficient quantity has been freshly laid on. This is done either by pricking through the lines and pouncing through the apertures with red or blue dust, or by marking over the lines with a blunt point, so that a slightly indented mark is left on the plaster underneath.

The outline being thus secured on the wall, the

painting is proceeded with, and in this the artist must depend entirely on his experience and knowledge of the result his work will produce; for the tints when first applied look faint and cold, and sink into the wet plaster, so that it is necessary to go over the work repeatedly before the required effect is attained.

The colours used are principally mineral, and are ground in pure water, which is also the vehicle employed.

The wall having been previously prepared and covered with plaster made of river sand and best old lime and mixed to about the usual slackness, the *intonaco* or painting surface is to be floated on. This must be prepared of the very best old lime, perfectly free from grit. The mixture must be made about the consistency of milk, and is then passed through the hair sieve into jars in which it is allowed to settle, when the water is poured off; the sediment is then mixed with fine quartz sand well sifted, in the proportion of one part lime to two of sand. This plaster is spread by means of wooden or glass implements; but iron trowels may be used if they are perfectly free from rust, and care is taken not to press the iron into the plaster.

The rough-cast ground is now to be thoroughly wetted, and the intonaco is to be floated on in two coats, the last with rather more sand than the first; the thickness of the two should be about 3-16ths of an inch. The whole is then to be gone over with a roll of wet linen, which will remove the marks of the trowel, and prevent the surface being too smooth.

When the intonaco has acquired sufficient firmness, which may be tested by pressing it with the finger, the first colouring may be applied. Where possible, the portion of plaster laid on for the day's work should be

made to end at some bold outline of the picture, or at the edges of some well-defined object. If the result of the work is not satisfactory, the artist is compelled to cut away the plaster and apply fresh; the process of fresco-painting thus becomes a slow and difficult one.

CHAPTER XXX.

USEFUL RECEIPTS.

CLEANING AND RESTORING.

Of the importance of this minor function of the art of painting a just estimate may be formed by considering that there is hardly a limit to the time which works in oil-painting may be preserved by care and attention. These are subject to deterioration and disfigurement simply by dirt,—by the failure of their grounds,—by the obscuration and discolourment of vehicles and varnishes,—by the fading and changing of colours,—by the cracking of the body and surface,—by damp, mildew, and foul air,—and by mechanical violence. The first thing necessary to be done is to restore the ground, if on canvas, by stretching or lining with new canvas. In cases of simple dirt, washing with a sponge or soft leather with soap and water, judiciously used, is sufficient. Varnishes are removed by friction or solution, or by chemical and mechanical means united, when the varnish is combined, as commonly happens, with oil and a variety of foulness.

TO REMOVE VARNISH

By friction, if it be a soft varnish, such as that of mastic, the simple rubbing of the finger-ends, with or

without water, may be found sufficient; a portion of the resin attaches itself to the fingers, and by continued rubbing removes the varnish. If it be a hard varnish, such as that of copal, which is to be removed, friction with sea or river sand, the particles of which have a rotundity that prevents their scratching, will accomplish the purpose.

The solvents commonly employed for this purpose are the several alkalies, alcohol, and essential oils, used simply or combined. Of the alkalies, the volatile in its mildest state, or carbonate of ammonia, is the only one which can be safely used in removing dirt, oil, and varnish from a picture, which it does powerfully; it must therefore be much diluted with water, according to the power required, and employed with judgment and caution, stopping its action on the painting at the proper time by the use of pure water and a sponge.

Many other methods of cleaning have been recommended and employed, and in particular instances, for sufficient chemical reasons, with success; some of which we will recount, because, in art so uncertain, it is good to be rich in resources.

A thick coat of *wet fuller's earth* may be employed with safety, and, after remaining on the paint a sufficient time to soften the extraneous surface, may be removed by washing, and leave the picture pure; and an architect of the author's acquaintance has succeeded in a similar way in restoring both paintings and gilding to their original beauty by coating them with wet clay. Ox-gall is even more efficacious than soap.

In filling cracks and replacing portions of the ground, putty formed of white lead, whitening, varnish, and drying oil, tinted somewhat lighter than the local colours require, may be employed, as plaster of Paris may also in some cases; and, in restoring colours

accidently removed, it should be done with a vehicle of simple varnish, because of the change of tint which takes place after drying in oil.

REMOVING PAINT,

Burning, &c. In those cases in which it is requisite to remove painting entirely from its ground, it is usual to resort to mechanical scraping, &c., or to the very dangerous operation of setting fire to the painted surface immediately after washing it over with oil of turpentine, called *turps*, for burning off the paint from old disfigured work; an operation that may be safely and more easily accomplished by laying on a thick wash or plaster of fresh-slacked quicklime mixed with soda, which may be washed off with water the following day, carrying with it the paint, grease, and other foulness, so that when clear and dry, the painting may be renewed as on fresh work. Clear-colling is sometimes resorted to over old painting, for the purpose of repainting, in which case the surface exposed to the sun's rays or alterations of temperature is liable to become blistered and scale off.

PART V.

THE CHARACTERISTIC FEATURES OF THE VARIOUS STYLES OF ORNAMENT.

CHAPTER XXXI.

OF ORNAMENT GENERALLY.

A "DECORATIVE painter" does not mean just one who can paint decoration, but it should imply that the person so termed understands what kind of ornaments should be applied as a system; so as to carry out the admirable rule that construction should be decorated, but that decoration should not be constructed. Further, he must bear in mind that in all decoration the leading idea of the designer should be *fitness;* for, however beautiful an ornament may be in itself, that beauty is sadly deteriorated when it is out of place.

Again, the decorative artist should make himself acquainted with the styles and orders of architecture, so that his decoration may agree with them. What should we say of a dramatic writer who introduces into a play, the period of which is supposed to be that of William the Conqueror, characters, or even costumes, belonging to the reign of Charles the First? and yet we see uneducated men painting Gothic ornaments on

buildings which are Greek in character, and making other blunders of a similar nature; such as rendering an ornament in the flat which was intended to be in relief, or placing a border on a curved surface when the whole beauty of the form consists in its geometrical and rectilineal character.

Ornament may, in the first place, be broadly divided into the symbolic and æsthetic; or, such as address our understanding, and those which appeal to our feelings. We may term those styles symbolic* in which the ordinary elements have been chosen for the sake of their significations as symbols of something not necessarily implied, and irrespective of their effect as works of art or arrangements of forms and colours. Those that are composed of elements derived solely from principles of symmetry of form and harmony of colour, and exclusively for their effect on our perception of the beautiful, without any further extraneous or ulterior aim, may be termed æsthetic.

Style in ornament is analogous to *hand* in writing. As every individual has some peculiarity in his mode of writing, as every man has his individual habit of thought and mode of expression, so every age or nation has been distinguished in its ornamental system, and by a certain individuality of taste, either original or borrowed.

There are two provinces of ornament—the flat and the relieved. In the relieved we have the contrast of light and shade; in the flat we have the contrast of light and dark: in both a variety of effect for the pure gratification of the sense of vision. Much of the effect is common to both; but in the flat a play of line is the main feature, whilst in the relieved a play of masses, acted upon by light, so as to produce shadows, which

* Wornum's Analysis.

materially add to the beauty of form, whilst colour may be an auxiliary to both, but it acts with greater power in the flat, as it is entirely dependent on light.

Although the varieties of ornamental systems are very numerous, they may be classed under three great periods—ancient, middle-age, and modern.

To the ancient belong Egyptian, Assyrian, Grecian, Roman; the middle-age period comprehends the Byzantine, Saracenic, and Gothic; whilst in the modern are classed the Renaissance, the Cinquecento, and the Louis Quatorze.

CHAPTER XXXII.

THE EGYPTIAN AND ASSYRIAN STYLES.

THE elements of Egyptian ornament have, as a rule, a particular meaning, being seldom, if ever, chosen for the sake of beauty of effect. The style is, therefore, very simple and limited in its arrangements in comparison with later styles, in which mere symbolism was superseded by the pure principles of art; the artist aiming at *effect* rather than meaning.

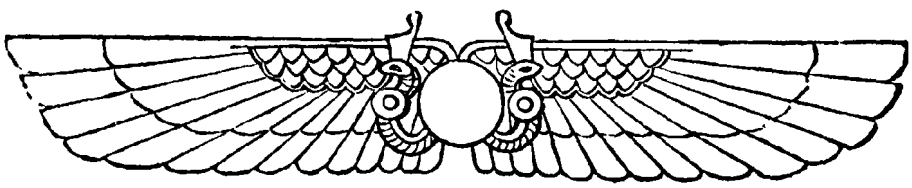


Fig. 10.

"Yet," says Mr. Wornum, "we cannot but admire the ingenuity with which the Egyptian decorator, by a mere symmetrical arrangement, has converted even

the incomprehensible hieroglyphics into pleasing and tasteful ornaments."

A simple symmetrical arrangement, however, is the limit of his artistic scheming, and generally in the shape of a simple progression, whether in horizontal lines, or repeated on the principle of the diaper; that is, row upon row, horizontally or diagonally, as seen in the Tombs of the Kings at Thebes.

The Winged Globe (Fig. 10) is the most important of Egyptian ornaments; it is supposed to have been an invocation to the good spirit, Agathodemon, and was used in architecture, costume, and every kind of manufactured fabric.

In one class of ornament Egypt is eminent, independent of its skilful application of art to manufactures: it is remarkable in its complete adaptation of its own natural productions in the development of a style peculiar to itself; in its conventional treatment of the natural types of the locality, as, for instance, the Papyrus-plant (Figs. 11 and 12), and the lotus or water-lily of the Nile, the element of so many varieties of ornament. The Egyptian details are not mere crude imitations of nature, but natural objects, selected by symbolism, and fashioned by symmetry into ornamental decoration. So that we have here one great class, and the earliest systematic efforts in design in the world's history. Many of the details of the Egyptians are still popular ornaments handed down to our own times, such as the fret or key border, &c.

Fig. 11.

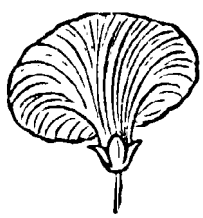


Fig. 12.

Next we have the Zigzag which was used as a type of the waters of the Nile, and is still preserved as the symbol of Aquarius, the water-bearer, in the Zodiac.

This has been a favourite ornament in all periods, and we shall again meet with it as the zigzag in the Norman, and as the dog-tooth in the early English styles.

Equal in importance to the zigzag is the Wave scroll, (Fig. 13); it typified the waves of the rising Nile, from

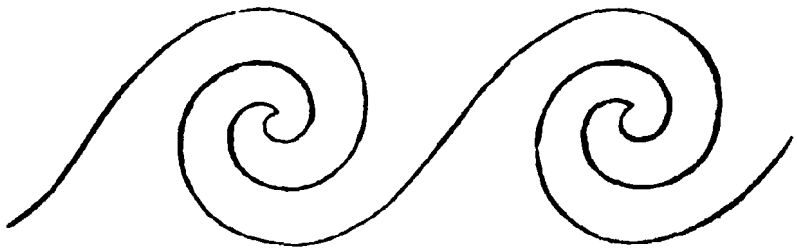


Fig. 13.

which Egypt derived so many benefits. It subsequently became a favourite ornament in Greece, where it no doubt suggested the idea of the scroll proper, in which the wave is alternated on each side of a serpentine line.

Next we have the lotus or water-lily of the Nile, and the papyrus-plant, both treated—as were indeed all the Egyptian ornaments—in a strictly conventional manner, as already shown in Figs. 11, 12; the former typified the fruitfulness produced by the inundations of the Nile, and was used not only as a flat, or even relief, ornament, but as a leading decoration on the Egyptian columns, around which it is frequently given as a frieze or broad band. Many of the columns are themselves founded upon its form, or rather upon the form of a bundle of the stalks banded together, with flowers on the capitals.

The Fret, or labyrinth, was the type of the Labyrinth of Lake Mœris, with its twelve palaces and three thousand chambers; representing, in their turn, the twelve signs of the Zodiac, and the three thousand

years of transmigration the soul was supposed to undergo. We illustrate in the next chapter this ornament as adopted by the Greeks.

Gaudy diapers and general gaiety of colour are likewise characteristic of Egyptian taste, but the colours are generally limited to red, blue, yellow, and green, though the Egyptians were acquainted with nearly all other colours.

The Assyrian style of ornament may be said to have been contemporaneous with the Egyptian. Its chief characteristics are sculptured records of leading events, and the human-headed colossi with bodies of either bulls or lions. The Assyrian buildings were erected on terraces composed of sun-dried bricks, faced with sculptured slabs of stone, with wooden columns and superstructure, which of course decayed as time progressed; this accounts for the circumstance that we have but little data as to the cornices and internal ornamentation, whilst we have large portions of the external sculptures, pavements, &c.

Fig. 14.

The Sphinx, or composite animal, with which the Assyrian bulls (Fig. 14) must be classed, were also important objects in Egypt—whole avenues of them, interspersed with obelisks, led to the temples; and we also meet with the sphinx in Greece, and a similar animal, called the chimera, in Rome. It must, however, be noted that the Egyptian sphinx (Fig. 15) is

always male and without wings, whilst the Grecian sphinx is female, with wings. It may be that the ancients—the Assyrians, at least—thought that the deities they selected to guard them should possess a combination of attributes which should render them in every way fitted for the position ascribed to them. Thus, for strength, they gave their idol the body of a bull; for wisdom, the head of a man; whilst, in order to give omnipresence, they added wings. Truly, in the words of Holy Writ, "they had mouths, but spoke not; they had eyes, but saw not; they had ears, but heard not; they had noses, but smelled not; they had hands, but handled not; they had feet, but walked not;" and have not all that made them become like unto them? For the nation has passed away, the palaces have crumbled to the dust, and these supposedly wise, powerful, and omnipresent watchmen have been buried for more than two thousand years. Armies have passed over them without dreaming of their very existence, corn has waved its golden head over them; and only in our own day have these records of the distant past been brought to light and lodged in the museums of Europe.

Fig. 16.

In addition to the sculptured histories, we find reliefs of several gods, and a peculiarly formed tree, called the sacred tree. This emblem occurs continually in Assyrian ornamentation. It is supposed to have some reference to the tree of life, so universally recognised as a sacred and mysterious symbol in the religious systems of the East. Mr. Fergusson has conjectured

that it may be identified with the "grove" so frequently mentioned in the Bible. It consists of an upright central stem, with branches extending to a kind of border formed by other branches proceeding in an upright form and bending into an arch above, flowers being placed at intervals. These flowers seem to be the "open flower" (Fig. 16) mentioned in the description of Solomon's temple, and to form the prototype of the Greek honeysuckle, whilst the "chain" (Fig. 17) was also used, and seems to have been the original guilloche

Fig. 16.

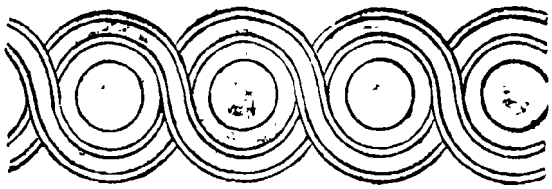


Fig. 17.

which afterwards became such a leading ornament in Greece. There are proofs that the ornaments were strongly coloured, and that much gilding was used.

Grandeur of proportion, simplicity of parts, and costliness of material, were the characteristics of the Egyptian style; and this love of gorgeousness prevailed in all Asiatic art, in which we find gold, silver, ivory, jewels, and colours profusely used. In the Hindoo art we find the fantastic element prevailing, and though the same jewelled richness is observed as in the Egyptian, the simplicity and grandeur are wanting.

CHAPTER XXXIII.

THE GRECIAN STYLE.

HITHERTO all the ornaments have been symbolic or descriptive; but when we come to Greece we find forms introduced for their own sake, for their beauty alone; and this must be considered as a decided step in advance. Architecture had made rapid strides, and sculpture having advanced with it, the pediments of the temples were filled with beautiful groups, and the frieze on the cella of the Parthenon was sculptured with a procession consisting of horses and men, which

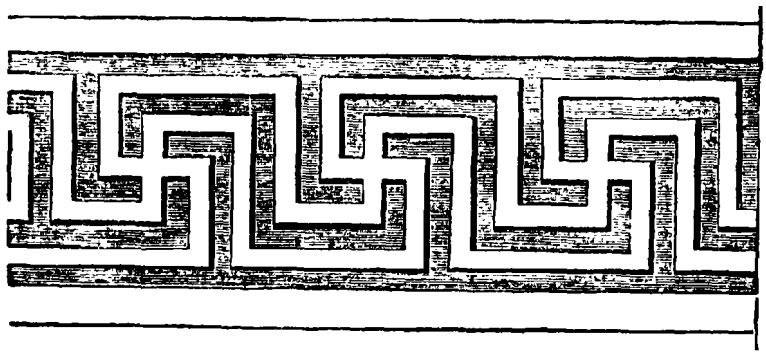


Fig. 18.

for grouping and execution has never been surpassed. It was placed in an elevated position in the cloister or covered walk around the building; and as the spectator was thus debarred from stepping backward to view it from a distance, the sculpture was executed in low relief, whilst full effect was still given to the roundness of the figures—which effect would have been lost from the closeness of the spectator had the work been executed in high relief, for when looking from below, the projecting parts would have

hidden the others. Portions of this frieze are in the British Museum, and casts, coloured to suit the various theories as to the extent to which the ancients applied colour to sculptures, may be seen in the Crystal Palace (Greek Court). The pediments (or triangular spaces above the columns at each end, corresponding with the gable-ends of a cottage) were filled with magnificent sculptures, the positions of the figures corresponding most gracefully with the form of the space they were to

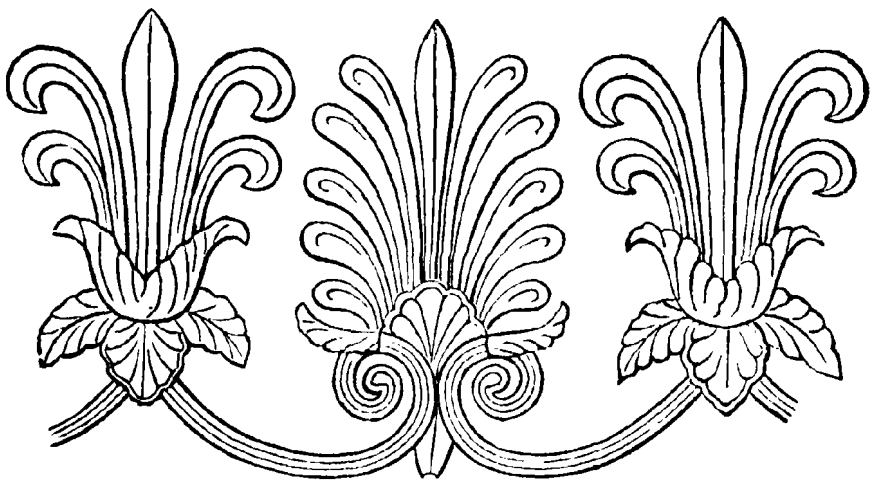


Fig. 19.

occupy. The frieze outside was filled with metopes or groups of figures and triglyphs, which were supposed to represent the ends of joists resting on the architraves. These were divided into three compartments by grooves or water-channels, and underneath are pendants, supposed to represent drops of water.

The first ornaments which we find in the Greek vases are those with which Egypt has already made us acquainted—the Zigzag, the Wave scroll, and the Labyrinth or fret (Fig. 18). The most characteristic

ornaments of the period, however, are the Echinus, or horse-chestnut, popularly called the egg and tongue, and the Anthemion or honeysuckle (Fig. 19), or Palmette, both of which it in some degree resembles; it is generally alternated with the lily, or some analogous form.

The capital forms in the three Greek orders (the Doric, Corinthian, and Ionic) the distinctive architectural ornament. The Doric capital consists of a circular flat cushion, called the Echinus, from its being invariably decorated in colour with that ornament, and the order is frequently called the echinus order. In the Greek forms the curves are flat, being portions of ellipses and parabolas, not of circles. This is no doubt owing to the practice of polychromatic decoration which was universally adopted; and it has already been remarked that high relief, as producing shadows, is antagonistic to the effect of colour.

In the second, or, as it is called, the Alexandrian, period, the ornamental forms were elaborated and the simple scroll added to them: this, in its original development, consisted, as already stated, of a succession of spirals reversed alternately, and the practice of carving, instead of painting, the ornaments began; horns or volutes were added to the capital, a border of the Anthemion was often placed under them, and thus the Ionic capital was formed.

In the Corinthian capital the volutes are further developed—the body is a graceful bell, clothed with the acanthus leaf. The ordinary scroll and acanthus were only in a slight degree developed in Greece, but became leading features in the Roman system of ornamentation.

ROMAN.

The Roman system of ornamentation cannot be considered in any way original, since the only new

form which appears is that of the shell, which in later periods became such an important feature in certain styles of ornament. The Romans, however, enlarged, decorated, and developed the Greek elements, which they embellished and amplified until the original refinement was lost in gorgeousness. The Greek origin is no doubt attributable to the fact that most of the artists employed were Greeks.

The chief characteristic of the Roman style, then, is great magnificence, the Acanthus being largely em-

Fig. 20.

ployed. The Composite order now appeared, made up of the echinus, the volute, and the acanthus; and the scroll and acanthus, which had both been so sparingly used in Greece, now became leading features, almost every ornamental form, indeed, being enriched with the acanthus.

The Roman acanthus is, however, distinct from the Grecian; the Greeks used the *Acanthus spinosa*, or narrow prickly acanthus, whilst the Romans adopted the *Acanthus mollis*, or soft acanthus, known to us as the Brank Ursine. But they mostly, for capitals, used

conventional clusters of olive-leaves, in order to obtain the strong effects required on the pillars of their lofty temples; this modification does not, however, seem to have been adopted in any other situation. Fig. 20 is a sketch from a well-known example of a Roman scroll decorated with the acanthus.

The Tuscan capital is simply an Italian rendering of the Doric, in which the echinus is exchanged for a quarter round—an astragal, or narrow half-round moulding, taking the place of the annulets or zones underneath the Doric capital.

The Romans, as well as the Egyptians, Assyrians, and Greeks, used monsters and composite animals, such as the triton, the griffin, the chimera, &c., which may be seen on the sculptures of the period.

CHAPTER XXXIV.

BYZANTINE.

When Constantine, the first Christian emperor of Rome, removed the seat of empire to Constantinople, previously called Byzantium (about A.D. 330), he took with him the arts of the former empire—which were then in a most debased condition—and applied them to the enlargement and decoration of the new city. Thence arose that combination of Roman, Greek, and Oriental traditions which distinguish the Byzantine style (Fig. 21).

Mr. Wornum in his Analysis says: "The peculiar views of the Early Christians in matters of art had, before the establishment of Christianity by the State,

no material influence in society, though the pagan idolatries found many vigorous opponents long before the time of Constantine. During the first and second centuries Christian arts were limited to symbols, and were then never applied as decoration, but as exhortations to faith and piety. All Christian decoration rests upon this foundation—the same spirit of symbolism prevailing throughout, until the return to

Fig. 21.

the heathen principle of beauty (to the æsthetic) in the period of the Renaissance."

The early Christian designers, most of them no doubt connected with the Church, seem rather to have avoided than sought beauty in these peculiar forms, from precisely the same feeling by which the Egyptians were animated. The lily (fleur-de-lis), the emblem of the Virgin and of purity, is as common as the lotus

was in Egypt, though having a very different meaning, and a peculiarly angular rendering of the Greek acanthus was also used.

The reason why the beautiful forms of Greece were rejected seems to have been none other than that they were pagan in their origin. Paganism, however, consisted solely in forms, not in the colours adopted; still, as paganism itself expired, the scroll and other ornaments were admitted, the foliage being rendered in the peculiarly formal manner already described.

The chief varieties of the Romanesque are the Byzantine, the Lombard, and the Norman. Both the Lombard and the Norman may be considered in their main features as mere modifications of the Romanesque; certainly few examples of the Romanesque out of Italy were not derived directly or indirectly from Constantinople. The Norman has by most writers been considered as the first of the Gothic styles, and as such we shall class it here.

Besides the sculptured ornaments of the early Christians, their decorative effects were produced by polychromatic ornamentation, executed by means of painting and by mosaics.

The earliest paintings after the time of Constantine are to be found in the catacombs of Rome and Naples. The general characteristics of such paintings are, that the outlines are strongly defined by a very fine, firm, brown line, dark and broad; the figures are by no means well drawn; and the colours and shadows are not very forcible, although they are somewhat heavy. Byzantine mosaic work* may be classed under three heads—

* For much information concerning which we are indebted to the excellent account by Mr. J. B. Waring.

1. Glass mosaic, called Opus Musivum; used for both walls and vaults.
2. Glass tesselation, called generally Opus Grecanicum, conventional; generally inlaid in church furniture.
3. Marble tesselation, called indifferently Grecanicum and Alexandrinum, conventional; formed into pavements.

In the first division of mosaics we observe as a peculiarity that it was employed only to represent and reproduce the forms of existing objects, such as figures, architectural features, and conventional foliage, which were generally relieved with some slight indications of shading upon a gold ground, the whole being bedded on the cement covering the walls and vaults of the basilicas and churches.

The pieces of glass employed in the formation of this work are of very irregular shapes and sizes, of all colours and tones of colour, and the ground that almost invariably prevails is gold. The manner of execution is always large and coarse; yet, notwithstanding this, the effect of gorgeous, luxurious, and at the same time solemn decoration is unattainable by any other means as yet employed in structural ornamentation.

The second variety of Christian mosaic, the glass tesselation, or Opus Grecanicum, consisted in the insertion into grooves, cut in white marble to the depth of about half an inch, of small cubes of variously coloured and gilded "smalto," as the Italians called, and still call, the material of which mosaic is composed, and in the arrangement of these simple forms in such geometrical combinations as to compose the most elaborate patterns.

These differ from all that were produced by the former system in the essential particular of being purely

conventional in style. These ornamental bands it was customary to combine with large slabs of the most precious materials—serpentine, porphyry, pavonazzetto, and other valuable marbles, and apply them to the decoration of the churches and basilicas.

The third system of mediæval mosaic, the Opus Alexandrinum, which formed the ordinary church-paving from the time of Constantine down to the thirteenth century, and has in our own day been most successfully imitated in encaustic tile pavements, may be described generally as tesselated marble-work, that is, an arrangement of small cubes, usually of porphyry or serpentine, reddish-purple and green coloured, composing geometrical patterns in grooves cut in the white marble slabs which formed the pavement. The contrast between these two colours produces a monotonous but always harmonious effect.

SARACENIC.

The Mohammedan law forbidding the introduction of the forms of either animals or plants, a peculiar system of ornamentation was developed, consisting of scroll-work interlaced with a sort of conventional form approximating to the lily, mixed with ornamental inscriptions. Closely filled diapers, gorgeously coloured and gilded, form the leading characteristics; the reliefs on these wall-diapers were coloured blue on the background, red on the edges of the reliefs, and gold on the surface.

The late Mr. Owen Jones must be accepted as the modern exponent of this style, and his great work on the Alhambra should be carefully studied by every decorative artist, since from it may be gleaned lessons of the most important character as to the correct distribution of form and space, and the principles of

ornamentation. The following remarks are based on Mr. Jones's description of his reproduction of portions of the Alhambra in the Crystal Palace.

In surface decoration of the Moors, all lines flow out of a parent stem: every ornament, however distant, can be traced to its branch and root; they have the happy art of so adapting the ornament to the surface decorated, that the ornament appears as often to have suggested the general form as to have been suggested by it. In all cases we find the foliage flowing out of a parent stem (Fig. 22), and we are never offended as in modern practice by the random introduction of an ornament just dotted down without a reason for its existence. However irregular the space the Moors had to fill, they always commenced by dividing it into equal areas, and round these trunk lines, they filled in the detail, but invariably returned to the parent stem.

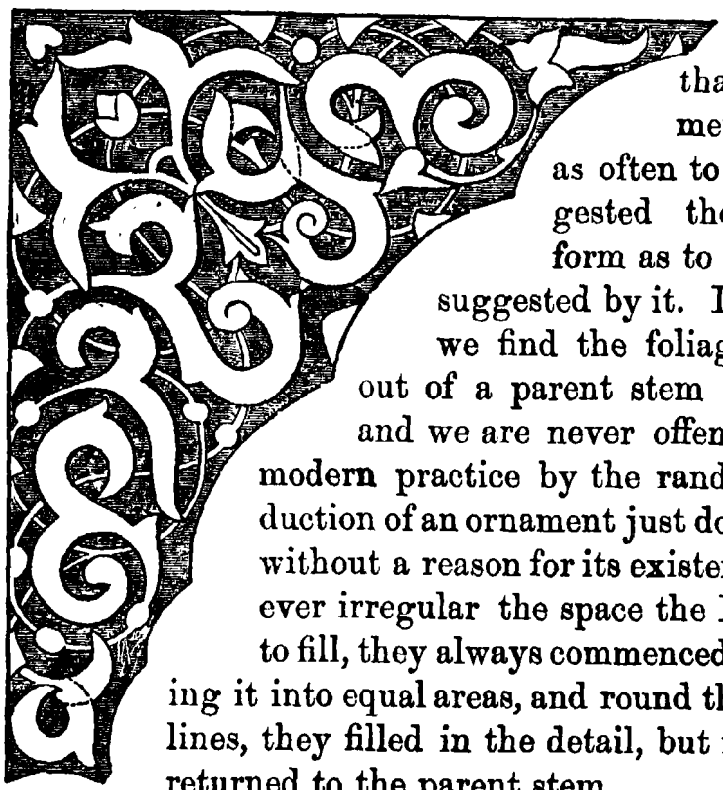


Fig. 22.

They appear in this to have worked by a process analogous to that of nature, as we see in the vine-leaf; they also followed the principle of radiation, as in the horse-chesnut, &c. (Fig. 23). We see in these examples how beautifully all these lines radiate from the parent stem; how each leaf diminishes towards the extremities; and how each area is in proportion to the leaf. The Orientals carry out this principle with marvellous perfection; so did the Greeks in their honeysuckle

ornament. It may here be remarked that the Greek ornamental forms appear to follow the principle of the cactus tribe, where one leaf grows out of the other. This is generally the case with the Greek ornament; the acanthus leaf-scrolls are a series of leaves growing out of each other in a continuous line, whilst the Arabian ornaments always grow out of a continuous stem.

Another important principle in ornamentation was carried out by the Moors; namely, that all junctions of

Fig. 23.

Fig. 24.

curved lines with curved, or of curved with straight (Fig. 24), should be tangential to each other. This law is found everywhere in nature, and the Oriental practice is in accordance with it. Many of the ornaments are on the principle which we observe in a feather and in the articulations of every leaf; and to this is due that additional charm found in all perfect ornamentation which we call graceful. We shall find these laws of equal distribution, radiation from a parent stem, continuity of line, and tangential curvation, ever present in natural leaves.

CHAPTER XXXV.

GOTHIC.

THIS great middle-age period has been variously divided: we adopt the simplest classification. The Saxon style, of which but few examples remain in this country, contained but few ornamental features; and although the first ecclesiastical style was Romanesque in its origin, it is characterized by the small windows with semicircular heads, the lights divided by a baluster instead of a mullion, and semicircular arching generally.

The Gothic grew out of the Byzantine, and flourished chiefly on the Rhine, in the north of France, and in England. If we consider the Norman as the first Gothic (of which it certainly was the forerunner or starting-point), the style commenced in England with the Norman invasion; it was developed in the thirteenth, and was perfected in the fourteenth century; in the fifteenth century it rapidly declined, and became extinct in this country in the sixteenth century; and has, in recent years, been revived with an amount of vigour which is so characteristic of the age we live in.

The peculiarly Norman style, such as is best known in this country, was originally developed in Sicily; it contains, of course, many Saracenic features, of which the pointed arch (introduced in the second or transition period) and the zigzag are the most prominent; for the Norman, though originally a simple Romanesque style, eventually adopted in the twelfth century the pointed arch of the Mohammedans.

The periods of Gothic may be briefly stated as follows:—

The Round Norman, or zigzag style (William I.).

The Pointed Norman, or Transition (Henry II. or first Plantagenet).

The Early English Gothic (Henry III. or second Plantagenet).

The Decorated Gothic (The Edwards, the third Plantagenet style).

The Perpendicular Gothic (Henry VII. or Lancastrian), ending in the Debased Perpendicular or Tudor (Henry VIII.), which scarcely deserves to be separately classed.

Fig. 25.

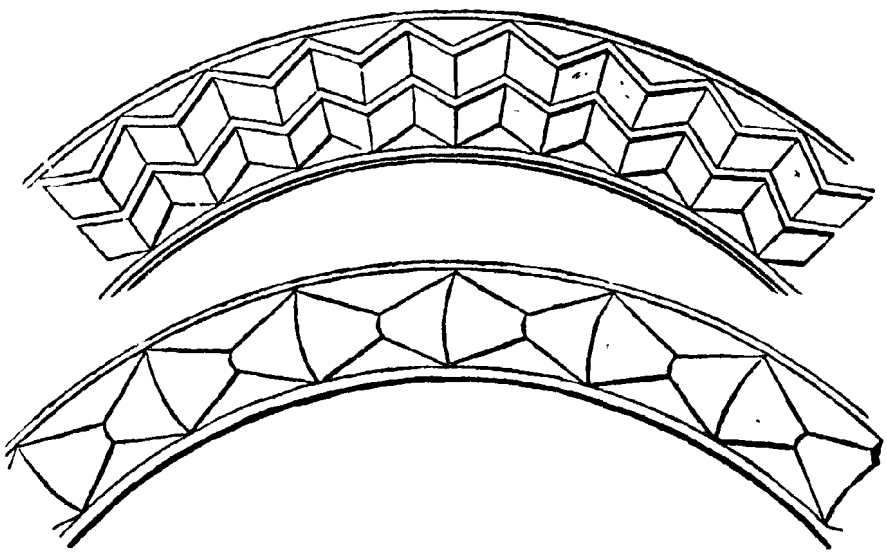


Fig. 26.

The Norman.—The chief characteristics of this style are the great solidity of its columns or piers, its semicircular arches, and its numerous ornamental borders or bands, miscalled mouldings.

The fact is, that the walls were of immense thickness, and at the soffits of arches this thickness was gradually diminished by being recessed, in order to remove the disagreeable appearance of the very wide intrados of the arch; on the perpendicular faces of the

parts so recessed the ornamental bands were carved; the edges of the projections were in later periods cut away, or chamfered, and were subsequently worked into hollows and rolls, and thus we have the origin of mouldings.* Amongst these ornamental bands we have the Chevron or zigzag (Fig. 25), the Double cone (Fig. 26), the Beak's head, the Billet, the Chain, the Star, and an infinity of others; the chevron is, however, the most general, being found in every Norman building. The capital, called generally the cushion capital, is for the most part a mere block from which the lower angles are chamfered away; in some examples the lower part was fluted and otherwise ornamented.

In the *Transition* from the *Norman* to the *Early English*, we find the pointed arch, together with mouldings and other features altogether Norman. The most important form, however, introduced in the transition period was the "roll and fillet," a moulding which continued to hold a leading place in the combinations of the succeeding styles. It may be described as a narrow band or fillet set flat upon the face of the common cylindrical roll. In the earlier examples it is mostly set square upon the round member; but it is often found with the joining edges rounded off, so that the fillet merges gradually into the roll.

Early English.—The windows form very characteristic features in the Gothic style, but it is not possible here to enter deeply into that interesting subject. We will therefore only briefly mention that, in the period under consideration, the windows are for the most part long and narrow, with acutely pointed heads. These were often gathered together in two, three, five, or seven lights under one dripstone.

* For full description of mouldings, and of the Gothic style generally, see "Gothic Stonework," by Ellis A. Davidson.

It will be easily understood that when two windows of the lancet form were gathered under a dripstone rising to a point, a blank space, known as the tympanum, was formed. In process of time this was pierced with another light, in the form of a circle, ellipse, trefoil, &c. This feature was subsequently elaborated, and has been termed "plate tracery." It was the origin of the magnificent tracery which formed the leading characteristic of the next period. The capitals of

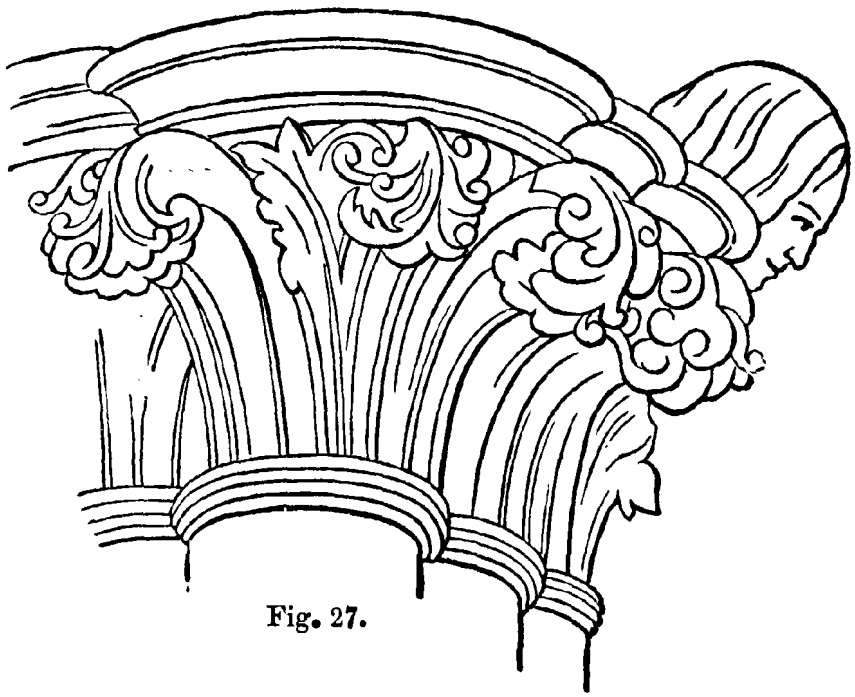


Fig. 27.

this period are bell-shaped, and are often, especially in the smaller examples, quite plain; but in the larger and richer specimens as, in Fig. 27—from Stone Church, Kent—the bell is covered with a peculiar rendering of the trefoil-leaf, springing from the neck and rising in a direct manner until it bends over in clusters; this has been called the stiff-leaved foliage: the method of thus rendering the trefoil evinces a desire to aim at the representation of natural forms, which was so well

accomplished in the Decorated, and which declined in the Perpendicular period.

The most characteristic ornament of the Early English period is the Dog-tooth or "tooth" ornament (Fig. 28). It bears, however, no relation to a tooth, but is merely a solid rendering of the zigzag, and consists of a series of pyramids placed on their bases next to each other, and sometimes pierced with the trefoil ornament. It is also frequently rendered as a flower with four petals bent backwards.

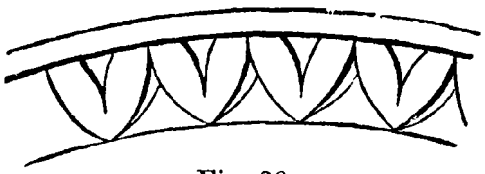


Fig. 28.

A beautiful method of ornamenting flat surfaces, which had originated with the Normans, was prevalent at this and subsequent periods; this was the manner of covering walls or portions of them with

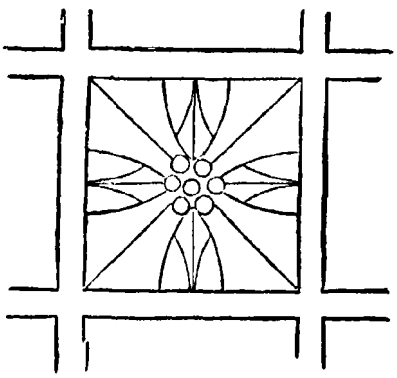


Fig. 29.

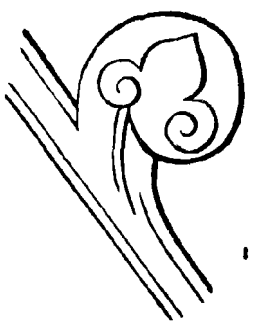


Fig. 30.

what has been called "diapering."* The diaper consisted of a small flower, or geometrical pattern, carved in low relief, the design being repeated in separate

* The origin of this term has been much discussed. It is supposed to be taken from a kind of cloth worked in small square patterns, and which was then as now much used under the name of Dyaper, originally d'Ypres, the chief manufactory being at Ypres, in Belgium.

squares or other figures. Fig. 29, from Westminster Abbey, is an illustration of one of these.

The crocket and finial were also ornamental features of this and the subsequent periods. The crocket consisted, in the first place, merely of the pastoral crook, but soon became an ornament formed of the trefoil. Fig. 30 is one of the earliest, and is taken from Lincoln Cathedral. The finial consists of a bunch of crockets placed at the apex of the spires.

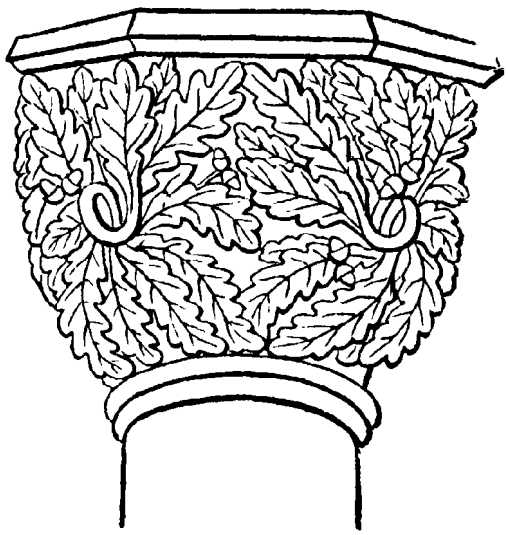


Fig. 31.

In the Decorated period we have two very distinguishing features. First, that the tracery was developed into the most beautiful patterns; and that the leading ornamentation is based on natural forms. The tracery is of two kinds: the geometrical and the flowing. In the former, the pattern consists entirely of geometrical combinations, as trefoils, quatrefoils, cinquefoils, hexafoils, &c., based on triangles, squares, pentagons, hexagons, &c. In the flowing tracery these figures, though still employed as the bases, are not completed in themselves, so as to stand out individually, but merge into each other: thus producing the most graceful forms, which have been called "flame-like" compartments.

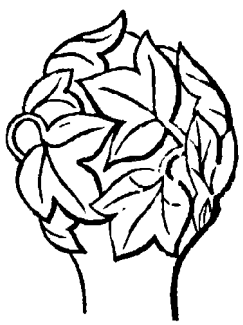


Fig. 32.

In the *Decorated* period the capitals are either bell-

shaped or octagonal, the foliage being wreathed around it instead of rising perpendicularly from the neck, as in the Early English. The leaves of the oak, maple, vine, ivy, strawberry, hazel, ferns, &c., are all so beautifully rendered as to give evidence of their having been taken directly from nature. The oak seems to have been an especial favourite. Fig. 31, which illustrates these remarks, is from York Cathedral; and this system was also carried out in the crockets and finials. One of the latter, from Cherrington, is shown in Fig. 32.

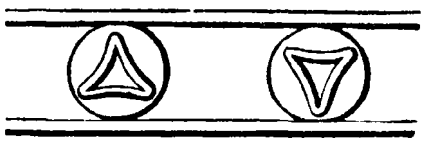


Fig. 33.

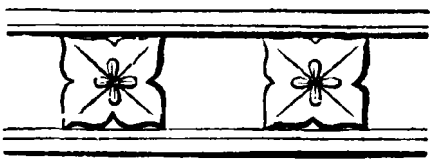


Fig. 34.

The Ball flower (Fig. 33) and Square flower (Fig. 34) were the most prevailing ornaments of the period.

The *Perpendicular style*, when fully developed, is characterized by the exuberance and redundancy of its ornaments. In the latter portion of the period it became so excessive, that the term "Florid" has been applied to it. The term Perpendicular has, however, been adopted in consequence of the peculiar arrangement of the tracery in the window heads, which form a very marked characteristic of the style. The beautiful flowing contour and curved lines of the tracery which so adorned the windows of the Decorated period, were superseded by mullions running perpendicularly from bottom to top, with transoms crossing horizontally; the roofs also were lowered, and the arch was flattened, until at last, in the Tudor period, it was drawn from four centres; and, in the Debased period, it was flattened altogether.

The capitals were either circular or octagonal, the

bell portion being mostly plain, but often covered with foliage of a harsh and conventional character, without either the freedom and boldness of the Early English or the natural grace of the Decorated period. Fig. 35, taken from the west doorway of Beverley Church, Yorkshire, will illustrate these remarks.

The leading features in the ornamentation of the Perpendicular period are—panel tra-

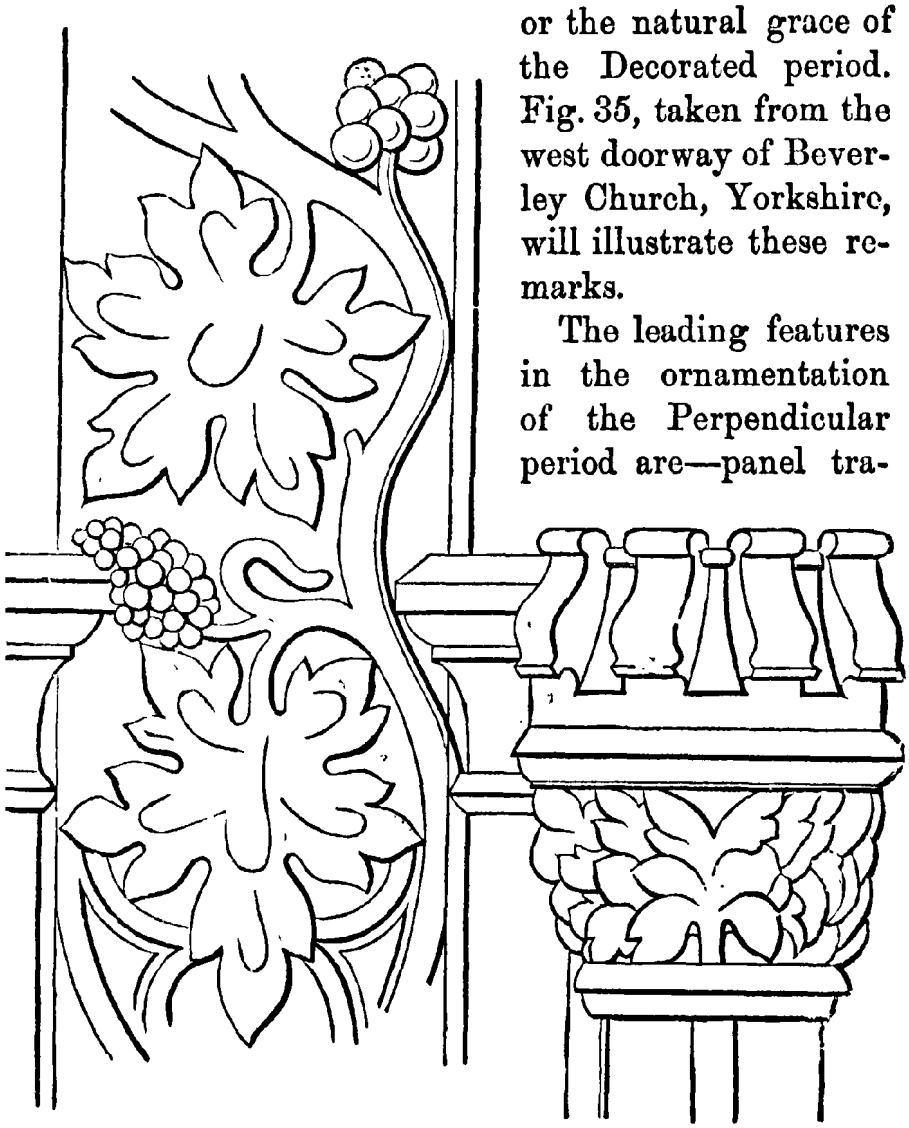


Fig. 35.

cery, which corresponds in some degree with the diaper work of the previous period, the patterns being, however, formed of mullions or tracery, quatrefoils, trefoils, &c.; a very rich description of vaulting, composed of pendant semicones covered with foliated panel work, called

"fan tracery." The Tudor flower, the Portcullis and Rose, both badges of the Tudors, were also constantly used as ornaments; and the Angel bracket is very frequent, especially in the reign of Henry VII., angels being placed at intervals in the string courses.

The gradual decline of the Gothic style is very evident in the later churches of this period, especially in those begun in the tenth century. It will be easily understood that the Reformation formed a bar to the revival of this style; and the introduction at the same period of the Renaissance style, whilst the elements of the Gothic, though much degraded, were still in existence, led to the mixture of features, and that incongruity of style, which followed, and which has been called the Debased Gothic, in which every real principle of beauty was lost.

In Italy the Gothic was at once superseded by the classical; but in other countries it waned into what has been termed the "After-Gothic," which in its turn gradually merged into the revived Classic, which will presently be described.

Within recent years a revival of Gothic has taken place in this country, and buildings have been, and are being, erected which will bear comparison with those of the Middle Ages. We have architects, too, who in their scientific principles of construction, and in their enthusiasm, have not been surpassed at any period. Let us hope our artisans will avail themselves of the opportunities now held out to them for acquiring the skill to worthily carry out the works, and that our designers and decorators will make themselves acquainted with the principles of the architecture of different periods, so that they may understand the application, and enter into the spirit, of the system of ornamentation to be adopted in accordance with the style.

CHAPTER XXXVI.

THE RENAISSANCE.

THIS style was the revival and combination of the most beautiful elements of Classic art. The return to these was due to the gradually growing influence of the Saracenic, not as an absolute style, but as affording new elements of beauty, especially in its varied and intricate interlacings, which were so prominent for a while as to constitute the chief characteristic of a new style.

Fig. 36.—Bronze from Door of St. Maclou, Rouen, 1542 (Wornum).

The first step of the transition from middle age to modern art is known from its mean time (about 1300) as the *Trecento*, the great features of which are its intricate tracery or interlacings and delicate scroll-work of conventional foliage—the style being a combination of the Byzantine and Saracenic, the symbolism of both being excluded. The foliage and floriage, however, are not exclusively conventional, and it comprises a fair rendering of the classical orders with the *restoration of the round arch.**

In the *Quattrocento*, the next period of this style,

* For much of the above information the writer is indebted to Mr. Wornum's admirable lectures (1848, 1849, and 1850). Digests of these lectures are now published under the auspices of the Department of Science and Art, and the reader is urged to supplement the sketch here given by further study from that work

we have a far more decided revival. The bronze gates of the Baptistry of San Giovanni, by Lorenzo Ghiberti (1425-52), exhibit one feature of this period in perfection—the prominence of simple natural imitations, which now almost entirely superseded the conventional representations of previous times. Nature no longer supplied mere suggestions, but afforded directly exact models for imitation, whether fruit or flowers, birds or other animals, all disposed with a view to the picturesque or ornamental. The selection of the details might still have some typical significance, but this had no influence on the manner of their execution, which was as purely imitative as their arrangement was ornamental. Thus, in the grand border surrounding the gates of Ghiberti, the flowers and fruit are grouped in the most luxurious manner, whilst birds and squirrels seem enjoying themselves according to their natural habits, the whole being evidently emblematic of the fulness of the Creation; yet, although some of the forms—the egg-plant, the pomegranates, the pears, and the lilies—stand out in full relief, they are so disposed that their shadows do not hide the objects by which they are surrounded, but merely serve as it were to gather them into one harmonious whole.

It appears that in the year 1401 the civic trades of Florence were formed into guilds, called "Arti," represented by deputies called "Consoli." These patriotic men resolved to open a competition for a bronze gate, to be erected at the Baptistry, that should surpass the old one by Andrea Pisano. Seven of the greatest artists of Italy entered the lists, but the prize was awarded by the competitors themselves to Lorenzo Ghiberti, who was only at the time twenty-two years of age. This great work occupied him twenty-three years; and at the completion, so great was the admiration

it excited, that the consuls of the guild of merchants commissioned him to execute another corresponding door, of which, according to his own account, they placed the plan and execution in his own hands.

"They gave him full permission," says Vasari, "to proceed with the work as he should think best, and to do whatever might most effectually secure that this third door should be the richest, most highly adorned, most beautiful, and most perfect that he could possibly contrive or that could be imagined. He received more than 13,000 florins for his labour, and gained great fame and honour."

Casts of these gates are in the Art Schools of the Department of Science and Art, and may also be seen complete in the Renaissance Court of the Crystal Palace, in the hand-book to which, by Sir M. D. Wyatt and J. B. Waring, Esq., they are fully described.

The border, already described, surrounds the gates, which are divided into ten panels, representing Scripture subjects—

1. The Creation, up to the expulsion of Adam and Eve from Paradise.
2. Cain and Abel.
3. The Flood.
4. Passages in the history of Abraham.
5. The history of Esau.
6. The history of Joseph.
7. Moses on Mount Sinai.
8. The passage of the Israelites across the Jordan.
9. A battle between the Hebrews and the Philistines.
10. The meeting of the Queen of Sheba and Solomon.

"The love of nature," says Mr. Waring, "with

the first Renaissance artists became a passion, and was the basis of their style. It is this which gives such a wonderful charm to the works of that illustrious triad — Ghiberti, Donatello, and Lucca della Robbia, who, imbued with the true spirit of the antique, and an unusual sense of the beautiful, ennobled all, even the commonest subjects, which came from their hands. We are the more desirous that this should be well understood, since it is a fact too often lost sight of; and the 'Renaissance' implies not the revival of antique art only, but the return to that great school which nature keeps ever open to us." "The artist held his place modestly, working for the sake of art and the love of truth, whilst in his productions he sought, not to astonish by his skill or science, but to infuse into others that love of nature and the antique which inspired himself."

Our own *Elizabethan* must be considered as an elaboration of the Renaissance, probably introduced from the Low Countries, the only difference being that the Elizabethan exhibits a very striking preponderance of strap and shield-work; but this was a gradual result; and what we now term Elizabethan was not thoroughly developed until the time of James I., when the pierced shields even outbalanced the strap work. The pure Elizabethan is much nearer allied to the continental styles of the true classical ornaments, but rude in detail, occasionally scroll and arabesque work, and the tracery or strap-work holding a much more prominent place than the pierced and scrolled shields. Such are the varieties of the Revival distinct from the Cinquecento, or perfect form. A design containing all the elements of this period is properly called *Renaissance.* If it contains only the tracery and foliage of the period, it would be more properly called *Trecento.* If it con-

tains, besides these elaborate natural imitations, festoons, scroll-work, and occasional symmetrical arabesques, it is of the *Quattrocento*, the Italian Renaissance of the fifteenth century; and if it displays a decided prominence of strap-work and shield-work, it is *Elizabethan*.

The *Cinquecento* is the full development of the modern styles, and was the most prominent style of the sixteenth century; it is the real goal of the Re-

Fig. 37.—Chimney-piece, Louvre, by Germain Pilou (Wornum).

naissance, to which all the efforts of the fifteenth century tended.

The styles we have described all tended to the ultimate perfection attained in that now under consideration, which was only achieved by the artists of Italy when the glorious monuments of the ancients were excavated at the close of the fifteenth century; and, with these examples before them, Raffaelle, Julio Romano, the Lombardi, Bramante, and Michael-Angelo succeeded in developing the style until it surpassed in its beauty the very originals from which it sprang.

The leading elements of the Cinquecento may be con-

sidered to be—the arabesque scroll (Fig. 37), combining in its elements every other feature of classical art, with animals and plants rendered naturally or conventionally, the sole guiding idea being beauty of form; the beautiful variations of ancient standard forms, as the anthemion, the guilloche, the fret, the acanthus scroll, &c.; absolute works of art introduced into the arabesques, as vases, implements, and instruments of all kinds—strap and shield work being, however, wholly excluded, as not authorised by ancient practice; the admirable play of colour in the arabesques and scrolls—the three secondary colours, orange, green, and purple, are the leading ones—thus affording a contrast to the early periods of ornamentation, in which we have already shown the primary colours were preferred.

"The Cinquecento," says Mr. Wornum, "may be considered the culminating style in ornamental art, as presenting the most perfect forms and pleasing varieties, nature and art vieing with each other in their efforts to attract and gratify the eye. It appeals only to the sense of beauty. All its efforts are made to attain the most attractive effects, without any intent to lead the mind to an ulterior end, as is the case in the Byzantine and other symbolic styles. The Cinquecento forms are supposed to be symbols of beauty alone; and it is a remarkable concession to the ancients that the moderns to attain this result were compelled to recur to their works; and it is only now, in contemplation of this consummate style, that the term Renaissance becomes quite intelligible. The Renaissance, or re-birth, of ornament is accomplished in the Cinquecento; still the term is not altogether ill appropriated to the earlier styles, because these were really the stepping-stones to the Cinquecento, and, as already explained, in them

also the æsthetic was substituted for the symbolic. The principles, therefore, were identical, though, from the imperfect apprehension, elements strange to the classical period were generally admitted: it was a revival of principle, though not of element."

The great characteristic of the *Louis Quatorze* style (1643-1715) is its gilt stucco work, which almost entirely superseded decorated painting; the ornamental features being rendered in very high relief, depending

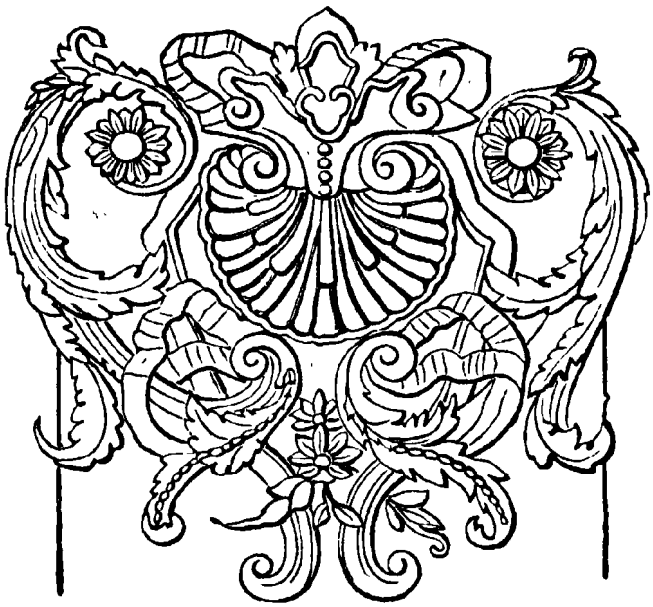


Fig. 38.—Carved Wood, Notre Dame, Paris (Wornum).

more on the play of light and shade than in the colouring; in fact, the favourite ornament, the anthemion, under a treatment which rejected flat surfaces and necessitated hollows and projections, became the hollow shell, which is perhaps the most leading ornament of this style.

The *Louis Quinze* (1715-74), Fig. 38, does not much differ from the Louis Quatorze in its elements, but yet, from a certain manner of treatment, must be considered

as distinct in a discrimination of styles. It differs in this, that the merely characteristic elements of the Louis Quatorze became paramount in Louis Quinze; all its details, instead of coming direct from the Cinquecento or Renaissance, came immediately from the French schemes of the preceding reign, and the divergence from the original types thus became wider.

The infinite and fantastic play of light and shade being the great idea of the Louis Quatorze period of ornamentation, exact symmetry in the parts was no longer essential, and accordingly we find, for the first time, symmetry systematically avoided. This feature was gradually increased in the Louis Quinze style, and ultimately led to the debased system of ornamentation (if system it can properly be called) known as the *Rococo*, in which balance of separate parts, or symmetry of the whole, was entirely set aside.

INDEX.

THE END.

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